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The Health Bulletin

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This Bulletin will be sent free to any citizen of the State upon request.

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NO. 19 © HEALTH BOARD DRAWN.

Which Children Are Yours?

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FREE HEALTH LITERATURE

The State Board of Health has available for distribution without charge special literature on the following subjects. Ask for any that you may be interested in.

WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SPIT PLACARDS	ADENOIDS
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
TUBERCULOSIS	EYES	TYPHOID FEVER
SCARLET FEVER	FLIES	DIPHTHERIA
INFANTILE PARALYSIS	COLDS	PELLAGRA
CARE OF THE BABY	TEETH	CONSTIPATION
FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREAL DISEASES
TUBERCULOSIS PLACARDS	MALARIA	CATARII

FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The Health Bulletin is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for The Bulletin each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.

The Road of the Loving Heart

On an Enchanted Island

Of the South Seas, where the shining water is ever the sky's blue looking-glass, runs the Ala Loto Alofa, the Road of the Loving Heart—a Road of Gratitude.

The Road was built by the Samoan chiefs for their beloved "Tusitala"—Teller of Tales—as they called Robert Louis Stevenson, the beloved of every nation.

Stevenson's Road—paved with love and gratitude—led to the island home he built in a world-wide quest for health. The road still climbs up the mountainside to Vailima, and is trod yearly by hundreds who visit Stevenson's former home because of their gratitude for the priceless heritage of his life and writings.

But a Far Greater Road

is being built today—a road on which year after year more and more grateful people shall walk. A road which shall not only endure for hundreds of years, but for all time. A road which far-away descendants will remember and bless those who are laboring for them now.

It is the Road of Health

Its builders are far-seeing physicians and public and private agencies.

The Road of Health is the only road upon which the sun shines. It is the only road from which the real beauties of life can be seen. It is the road sign-posted with happiness and success. It is the road which leads to the delectable mountain of fulfilled hopes and ambitions.

Health is not the monopoly of any one group or class. And so the road of Health is a great public highway open to all who keep themselves physically fit to travel it.

For However Smooth a Roadbed

However free from dangers, wrecks cannot be avoided unless the machine that travels the road is in good condition. And just as no locomotive or motor would be sent out, even on the best of roads, without occasional examination, so the human body—the greatest machine in the world—must be thoroughly examined by your doctor and regularly overhauled, if wrecks along the Road of Life are to be avoided.

Failure to have the complex human machine examined regularly means that you are ever in danger of being side-tracked to the Road of Sickness, a road over which many thousands needlessly struggle.

The First Baby Steps

should be taken on the safe, smooth Road of Health. On it the boy and girl should travel eagerly to school. From it the young business man and woman must not be allowed to stray. Fathers and mothers will find it the one shining Road that leads to a Happy Home. Stretching clear and white before you is the untrodden Road of the New Year.

Therefore be it Resolved

to swing wide the Gateway to the Road of Health—the wonderful new Road of Gratitude.

Take the first step today. Go to your doctor and have a thorough examination made of your body mechanism. The man and woman who find out just how they stand physically can, by proper care and right living, learn to avoid the Road of Sickness—can lengthen life and get far more out of it.

Have your children examined. The examination of a child oftentimes means the discovery of disease tendencies or of defects which, taken in time, can be cured or corrected. It may save deformities, blindness, or suffering that would make death preferable to life.

WAYS OF INFECTION

Bad air was once considered a prolific source of infectious and contagious diseases. Foul odors from decaying matter and gas from sewers were thought to cause typhoid fever. Night air was thought to cause malaria fever. And malaria in the system, if not watched, would run into typhoid fever. In recent years we have learned that much of this was wrong. With the improvement of the microscope, germs which were too small to be seen before can now be seen, and many can be grown on artificial food outside the body. They have been studied, and it has been found that they differ greatly in looks and in the way in which they grow and act. It has also been found that those which cause a particular disease—say typhoid fever—all look, grow and act alike, and that when they are injected into the body they will cause typhoid fever, and that they will not cause any other disease. With these discoveries, our older notions as to the vague causes of infectious diseases have given way to definite knowledge. We know the different germs when we see them through the microscope, and we know what diseases they will cause in the body. When diseases come to us through the air it is by way of germs on dust (which is rare). The association of night air and malaria comes from the fact that the germ of malaria is carried by a kind of mosquito which flies at night. Night air cannot cause malaria, and a malarial mosquito produces the disease just as easily by a bite in the daytime. And malaria cannot run into typhoid fever any more than cotton can turn into tobacco. Each germ disease has its own particular germ.

It is possible to grow a crop of diphtheria germs, or cholera germs, or tuberculosis germs as certainly as it is to grow a crop of potatoes. It is known that these germs cause the disease in question as surely as it is known that potatoes make good food, or that poison ivy causes skin disease.

Some germs are so small that they have never been seen yet, but they

can be grown and be made to cause disease. Their existence is known just as surely as if they were as big as turnips. We have never seen the germ of smallpox, but it has been studied in the laboratory. It can be made to cause smallpox, and a vaccine can be made to prevent it. It follows all the laws of a germ disease, and when the microscope is further improved, the germ will be seen.

Some germs are very small plants, called bacteria. Others are very small animals, called protozoa. Typhoid fever is caused by microscopic plants—the typhoid bacteria. Malaria fever is caused by microscopic animals—the malarial protozoa. Germs, therefore, follow the laws of plants and animals. Like produces like, and every one comes from a similar one before it somewhere. If you plant cotton it does not come up tobacco, and if you have typhoid fever you have taken a typhoid germ into your body. You may eat all the filth in the world, but it will not give you typhoid fever unless the typhoid germ is in it. And you may die from typhoid fever from the germs you drink in sparkling water which may look and taste ever so good and clean. It takes the germs of a disease to give you the disease, and you cannot have the disease without the germ.

Long before germs were discovered, it was known that smallpox, cholera, syphilis, plague and many other diseases were contagious—that is, that sick persons could transmit the disease to the well. The search for disease germs was first made in the sick, and there they were found. It was thought for a time that the sick person could spread the germs of his disease only while he was sick, believing that the germs disappeared as he became well. One of the important discoveries of recent years is that the germs of most diseases are not confined exclusively to the sick, but are frequently found in well persons. It has been learned that the bacteria which cause diphtheria often remain in the throat for a time after the patient is well—sometimes for a few weeks,

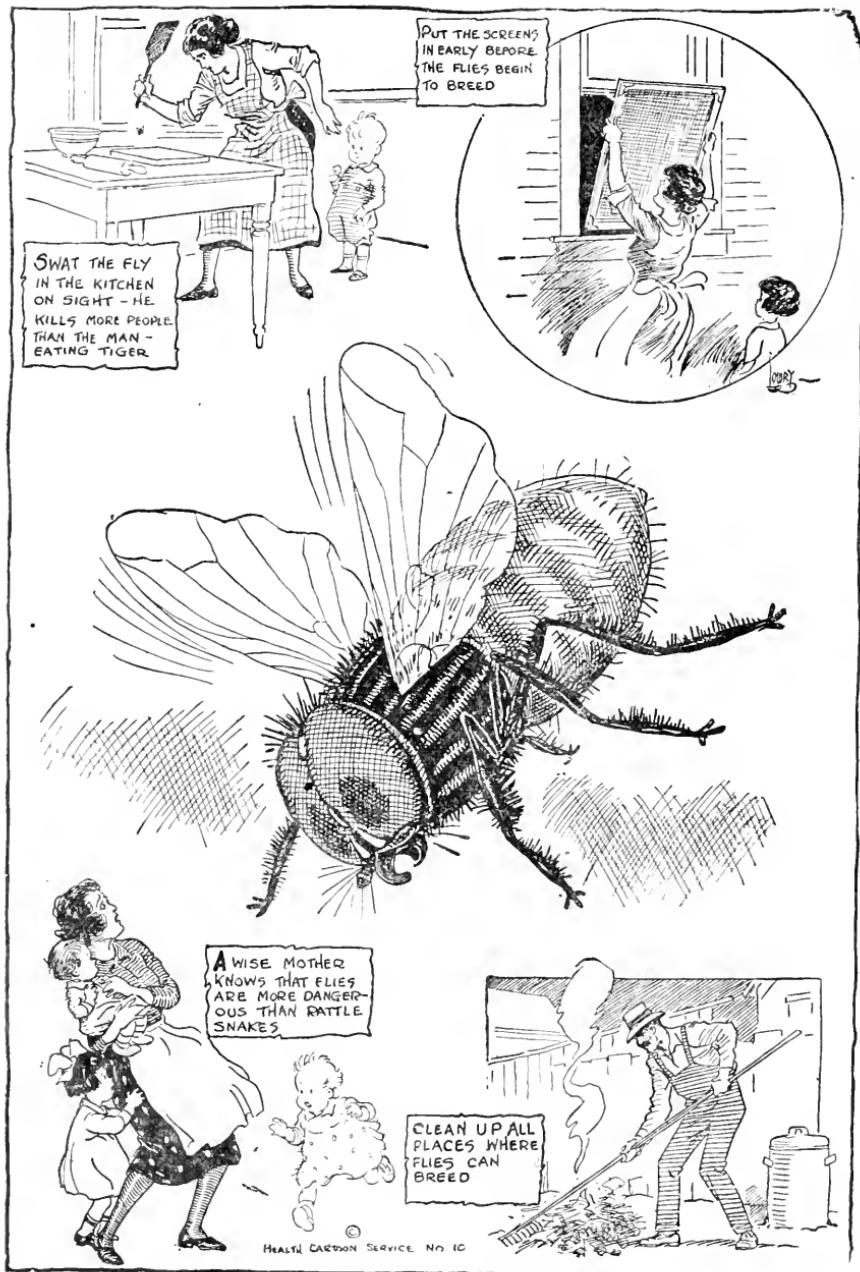
sometimes for months. It sometimes happens in diphtheria hospitals, where the cases can be watched and studied carefully, that a child who has come into the hospital with diphtheria, and has stayed until he is apparently well, goes home, and weeks later that child's brother, sister, or playmate develops diphtheria. The child who had diphtheria first and was apparently well is examined. His nose is found to contain diphtheria germs. He is taken back to the hospital and given a curative dose of diphtheria antitoxin and the diphtheria germs disappear from his nose and throat. This child's germs were not making him sick, but they were giving diphtheria to other children. He was what is called a diphtheria "carrier." After typhoid fever, the germs may still for some weeks be discharged from the intestines in the excreta. In some cases they get a foothold in the gall bladder of the patient and live and grow there the remainder of his life. From the gall bladder they make their way into the intestines, and then, through the excreta, to the outside of the body, where they are free to infect other people. Such a person—well, but infected—is called a "carrier" of typhoid germs. Not only are there people who are carriers in this way from having had the disease, but there are also those who have come in contact with the sick or with carriers, and have themselves become carriers without ever being sick at all.

We have learned also that in most of the contagious diseases there are many mild cases—so mild and with so few symptoms that they are almost sure not to be noticed. A child with a slight sore throat, and practically no other symptoms, may be sent along to school with little thought about it and without it being seen by a doctor. Yet many of these sore throats are really diphtheria, and the germs may cause a fatal case in the next one who contracts it. A man may have a slight "bilious attack," or merely feel "under the weather," for a few days, and really be a case of walking typhoid fever. If he is engaged in the milk business, it often happens that he is the cause of an epidemic of typhoid fever. These mild, unrecognized cases are called "missed cases."

The number of germ carriers and of missed cases varies greatly in different diseases. There are not very many such cases in smallpox and measles. But for every recognized case of diphtheria properly isolated at home or in a hospital, there is probably a mild, unrecognized case going about among the people, and doubtless several well carriers doing the same thing. Almost three per cent of all cases of typhoid fever become permanent carriers. For every case of cerebro-spinal meningitis there are probably ten or twenty practically well carriers. Moreover, in some diseases, as in measles, the disease is intensely contagious for several days before signs develop which are likely to be recognized as the signs of measles. When a child is sick in bed with diphtheria, and every one knows it, the danger of the disease spreading is not one-tenth so great as it would be if the same child had a mild sore throat, not recognized as diphtheria, and was going to school and mingling with the other children at play. Most people try to keep the cases of contagious diseases quarantined, so that these are not so dangerous when they are sick in bed. But it is from the carriers and mild cases which are missed that the danger comes, because these go about unsuspected and spread the disease.

Although we are surrounded by disease germs, we can remain healthy if we take steps to keep them from entering our bodies. So how, then, do they gain entrance to our bodies? Classified according to how we get them, the germs of infectious diseases may be divided roughly into four groups: (1) Those which are transmitted by spit from the mouth, and by secretion from the nose in coughing and sneezing. (2) Those which come from the feces in open privies. From here flies bring them to our kitchen and dinner table. And water which drains from the privies washes them into wells and springs. (3) Insects, such as mosquitoes, fleas, and ticks, carry the germs of most of the blood diseases. (4) And by actual contact with another body which is infected, the venereal diseases are transmitted.

Among the diseases transmitted by droplets of moisture from the mouth and nose in coughing and sneezing are



scarlet fever, diphtheria, septic sore throat, measles, whooping-cough, mumps, chickenpox, smallpox, tuberculosis, pneumonia, influenza, syphilis, cerebro-spinal meningitis, and infantile paralysis. The germ of the disease is in the spit of the mouth, and the moisture of the nose is thrown into the air in a fine spray in coughing or sneezing, and is taken up by the people close by. When you sneeze or cough, you should be in the middle of a field alone. All well-informed and intelligent people try not to sneeze or cough at all, and whenever they must they do it into a handkerchief or turn the head away from every one and toward the floor or ground. This keeps their germs from being thrown to others. Since the influenza epidemic, people generally know more about this than they did before. Most people now feel uncomfortable when a person close by coughs or sneezes, and if one coughs or sneezes in a crowd he is looked upon as careless and dangerous, and is free to go elsewhere. Never cough or sneeze if you can help it, and if you must do so, use your handkerchief. It will look better for you.

The diseases from the excreta of the body get back into the body by the germs being washed from the privies into wells or springs from which water is used to drink or to wash milk buckets; and by being carried by flies which walk on the excreta in the privies and then walk on your food. Typhoid fever, dysentery, and cholera are transmitted in this manner. All privies should be flyproof, and the excreta should fall into cans which do not leak. All windows should be screened, and every fly in the house should be "swatted." All water should come from deep-pump wells tightly covered and sealed. And whenever there is any doubt about the purity of the water or milk, these should be boiled before using. During the hot summer months it is wise to do this in the country, anyway.

Insects carry the germs of several diseases. Certain mosquitoes carry malaria. The mosquito sucks the blood of a person who has malaria. The germ grows in the mosquito and is in its mouth. It then bites a well person and puts the malaria germ into his blood, and he has malaria. Flies carry

typhoid fever and dysentery. These germs are present in the excreta of patients. The flies walk on it, get the germs on their legs, and then walk on your food. You eat the food, carrying the germs of typhoid into your intestines, and develop typhoid fever. The flies walk on the milk bottle of your baby, and it likewise gets dysentery. All swamps should be drained to destroy the breeding places of the mosquito. All garbage should be destroyed and all manure screened to destroy the breeding places of the fly. And every home should be screened to keep out both the mosquito and the fly.

By far the most important mode of infection is by contact. Many persons contract disease who have never been in contact with anyone else who was sick. So, people invented the theory that disease germs are wafted by the air, or originate in filth and dirt outside of the body. But when it became known how many "walking cases" of typhoid fever, how many slight sore throats of diphtheria, how many well "carriers" of cholera or infantile paralysis there were which had formerly been unrecognized, it was seen that disease spreads chiefly through contact of one person with another.

We can now easily see that the germs of most of our infectious diseases are in either the mouth or nose, or in the excreta of the body. Many people do not wash their hands after they have been to the toilet or privy, and on the hands of many people can be found at any time the germs which grow in the intestines. And almost every one puts his hands to his nose and mouth countless times during the day. So, there is constant interchange between people of the germs which grow in the nose, mouth and intestines. It is unpleasant to think of—and to many, at first, seems incredible—that the germs of such diseases as typhoid fever, which are discharged from the intestinal tract, should be transferred to the mouth of another. But observations have been made in a number of places which show that upon the hands of one in ten of medical students, nurses and physicians may be found germs which come only from the intestines. Among less careful persons, with less facility for cleanliness, the number must be greater.

So, then, the fingers are a large factor in transferring infection from one person to another. If one takes the trouble to watch other people, or even himself, it will surprise him to see how many times the fingers go to the nose or to the mouth, all unconsciously, for one purpose or another, or for no purpose whatever. In this general trade in spit, the fingers not only bring other people's germs to the mouth of their owner, but they carry his to everything that his hand touches. This happens scores and hundreds of times during his day's rounds. The one who cooks distributes her germs to those who eat her food. What if she be a typhoid carrier? The man who sells you apples to eat gives you his germs. Money carries the germs of all those who handle it. Children are the worst of all, "swapping" candy and using each other's pencils. All babies put everything into their mouths. And also babies and children are the easiest prey of the contagious diseases.

Dippers in public places are disappearing and separate cups or running fountains are replacing them. Mothers are learning that everybody should not kiss their babies. Coughing and sneezing in public stamps one as ignorant or careless.

The open privy is already looked upon as a menace, and the man who

keeps one is talked about behind his back. Soon the sanitation officer will tell him about it to his face and take him to court if he refuses to build a safe flyproof one. Your friends will enjoy eating dinner with you better if they can look out through screened windows at clean premises.

Those who keep their hands clean and keep them away from their nose and mouth carry less of other people's germs.

To stay well: Stay away from sick people, avoid people who cough and sneeze and particularly in crowded, closed rooms. Keep your hands clean and keep them away from your nose and mouth. Don't drink after any one else. Keep your privy flyproof and make your neighbor keep his the same. Have your well deep, with a solid wall and a cement top. Screen your windows and destroy all breeding places of flies and mosquitoes.

Every infectious and contagious disease is caused by a germ and the disease is impossible without its particular germ. Germs are small plants and animals which can be grown or killed. It is possible, therefore, with the intelligent coöperation of every one, to kill the germs and wipe their diseases from the earth. Every act of precaution to prevent germs from passing from one person to another helps the fight against disease just that much.

VACCINATION AND SERA

It is well known to every one that if a person has smallpox once he is not likely to have it again. This is also true of measles and largely true of typhoid fever. Why is it that if a person can have one of these diseases once he cannot likely have it again? If he goes into the room of a patient and drinks out of his glass he certainly gets the germs which would give the disease to him if he had not had it. This shows that there must be something about him which keeps the germs which he takes into his body from growing there. This something which keeps the germs from growing we will call antibodies. The anti-

bodies are substances in the blood which fight the germs when they come into the body. If the antibodies kill the germs the body will not have the disease.

Antibodies, then, are the defense against these diseases. There are different ways of getting them. One way is by having the disease and making them ourselves. Take typhoid fever for an example. Let a man who has never had typhoid fever be fed some typhoid bacteria. In a number of days he will begin to feel tired and drowsy. He will develop a fever and become sick with typhoid fever. He gets worse for a week or ten days.

During this time the bacteria are increasing in number and are making toxins (poisons) in his blood. If this continues he will die. But when the bacteria began work in his body his body also began making antibodies. The bacteria are working to kill the body with their toxins and the body is working to kill the bacteria with its antitoxin (or antibodies). Which will win? If the bacteria win the man dies. If the man produces enough antibodies he wins and the bacteria die, and he gets well. And when he gets well the antibodies which killed the germs and ended the disease still remain in the blood, standing guard, ready to make war upon the next typhoid germ which comes into the body. With the protection of this army of antibodies against the typhoid germ a second attack of the disease is made less likely. The presence of these protecting antibodies after the disease explains the immunity to such diseases as smallpox, measles and scarlet fever after the first attack. This kind of immunity is called an ACTIVE immunity because the individual produces his own antibodies.

A PASSIVE immunity may be acquired by borrowing some one else's antibodies. Diphtheria antitoxin is an example of this. If a healthy horse is selected and once a week a dose of toxin from diphtheria germs injected into it, its blood produces antibodies (antitoxin, we call it). The blood is drawn and tested at intervals and when it contains enough antibodies the horse is bled a large quantity and the blood is allowed to clot. The serum, or watery part which contains the antibodies is then poured off. This is diphtheria antitoxin. When a child has diphtheria this antitoxin, containing the antibodies produced against the toxin in the body of the horse, is injected into the child and it quickly gets better and soon gets well. The antibodies given to the child by the horse kill the diphtheria germs for it.

So then we are protected from germs by antibodies in our blood. And the antibodies may be produced by the fight in our own body or by the fight in some one else's body. And we are protected, or immune as the doctors say, by actively producing our own immunity or accepting a passive im-

munity from some one else's activity. Another way of producing immunity is by the injection of dead bacteria, or their products, as is done in vaccination against typhoid fever. In vaccination against smallpox, germs of smallpox which have been weakened by growing them on a cow are planted in the arm and allowed to grow. If they were strong enough we would have smallpox because they would grow to that stage before the blood could produce enough antibodies to kill them. But since the germs have been weakened before they were put into the arm, the blood can produce enough antibodies to kill them before they spread from the arm. In this way the sore of vaccination causes antibodies to be produced and left in the blood. When the vaccination sore is healed the antibodies are in the blood, just as they are after smallpox, and the person is protected against taking smallpox.

There is an antitoxin for tetanus (lockjaw) similar to that of diphtheria and prepared in the same way. The germ of tetanus does not grow well in the air and therefore does not grow well in the open wounds. It grows in puncture wounds, like that made by sticking a nail in the foot, and in deep dirty cuts in which the air cannot get to the bottom of the wound. There is usually a lot of tetanus after the Fourth of July because of the kind of wounds produced by fireworks. In 1903, tetanus following Fourth of July accidents caused 417 deaths, while in 1915 there was only one. Much of the improvement was due to a "sane Fourth," but much was due also to the improved treatment of the wounds and the use of tetanus antitoxin early (as soon as the wound was made).

There is a treatment with anti-rabie serum to prevent rabies or hydrophobia. This is the disease in a human being coming from the bite of a "mad" dog. Whenever a person is bitten by a "mad" dog he should take this treatment immediately. Whenever a person is bitten by any kind of a dog, the dog should be killed and his head should be examined by a laboratory specialist to see if the brain shows any signs of rabies. (A dog too valuable to be killed for biting



can wear a muzzle.) If there are signs in the dog's brain of the germs which cause hydrophobia, even though the dog was a peaceable dog, the person bitten should take the Pasteur anti-rabic treatment. It will not cure the disease after it has developed but it often prevents the disease from developing. In the home city of Pasteur before his discovery of the cause of hydrophobia and before his treatment of it, out of every 1,000 persons bitten by "mad" dogs 160 died. Out of those treated by Pasteur's treatment only 6 out of 1,000 died. Out of 1,000 people bitten his treatment saved 154 who would have died. His treatment can now be had in North Carolina. It consists of injecting the attenuated germ of hydrophobia (weakened by growing it in rabbits and then drying the rabbit's nervous tissues), about twenty-four doses, one every day or two. This helps to produce antibodies to kill the germs from the dog bite before they get a chance to grow, and keeps the bitten person from having the disease.

Vaccines and sera mark a great advance in medicine. They make it possible to keep from ever having some diseases at all which we used to be glad to recover from. We used to lose more men in the army from smallpox and typhoid fever than we did from fighting. Now we do not lose any from these diseases at all. Once we had to stand by holding our hands while we watched the child with diphtheria get well or die as chance would decide. Now if we give it antitoxin the first day it is sick it does not die. During the last few years toxin-antitoxin has been used to prevent diphtheria, and the children who have taken this treatment have remained comparatively free from diphtheria.

It is the aim of medicine to find such a preventative for every disease. Many doctors are now at work on such a treatment for influenza, and think of what it will mean when the treatment is found. They are also working on such a treatment for scarlet fever. And some day they will be found just as they have been found for smallpox, typhoid fever, diphtheria, lockjaw and hydrophobia.

Lockjaw and hydrophobia are not so common. But every case of a deep or

a dirty wound such as a nail puncture, bullet wound, or a deep cut received on the street or around the stable should have an intra-muscular injection of 1,500 units of tetanus antitoxin as near the site of the wound as possible as soon as it has been well opened and cleansed. And every suspicious dog bite should be treated with the Pasteur treatment.

But there are three diseases, in particular, against which every person should be vaccinated. These three diseases are smallpox, typhoid fever and diphtheria. They are dangerous and can be prevented. Vaccination will prevent them. You may say that you will avoid exposure to these diseases and keep from having them without being vaccinated. But nobody exposes himself purposely and every one hopes to avoid them. Still many people have the diseases. The germs are in drinking water and food which you think is pure, and upon the hands of people you do not suspect. Your only safe plan is to carry your protection with you in your blood.

North Carolina does not quarantine smallpox. Vaccination protects against it. Every one may have vaccination. The smallpox patient can go wherever he pleases. If you have been vaccinated within the last five years you are safe. If you have not been vaccinated you had better not go on the street or into a train or let anybody come into your home until you have been. The efficiency of vaccination in protecting against smallpox has been proven beyond the shadow of a doubt, and it is a safe procedure. In the Philippine Islands, before the United States took charge of them, it was necessary to erect a large temporary hospital in Manila each year to care for the thousands of cases of smallpox, the majority of whom died. Vaccination was introduced in 1907. Before then in six provinces around Manila at least 6,000 people died each year from smallpox. Since 1909 not one person has died of smallpox in Manila, and the few scattering cases which have occurred have been people who were not vaccinated.

Vaccination is very simple and all trouble usually comes from neglect of the arm after vaccination. Up to 1911 over 2,000,000 people in the

Philippines had been vaccinated without the loss of a single life or limb and without any serious case of infection. This record shows what a safe procedure vaccination is.

Typhoid vaccination was first tried out on a big scale in the army. Two armies of about the same size were the Spanish-American Army of 10,000 in 1900 and the army of 12,000 mobilized on the Mexican border in 1911. The Spanish-American army was not vaccinated. The Mexican was. The unvaccinated army had 2,500 cases of typhoid fever and 250 deaths. The vaccinated army had only two cases of typhoid and no deaths, although there was typhoid fever among the natives around them. Typhoid vaccination was begun in North Carolina in 1914. At that time there were 839 people dying yearly from typhoid fever. Since then this death rate has been reduced to 307 last year. We are now saving 532 lives each year with typhoid vaccine in conjunction with sanitary privies, and the 307 who are dying from typhoid fever are among those who fail to be vaccinated. Typhoid vaccine is given, hypodermically, once a week for three weeks, and its protection lasts about three years. The vaccination should therefore be repeated every three years.

There are two serum treatments for diphtheria. One is toxin-antitoxin. It is given like typhoid vaccine and should be given to every child between six months and six years of age. It prevents diphtheria as typhoid vaccine prevents typhoid fever. This has been in use only a few years. The second, an older serum for diphtheria, is the antitoxin. Its worth has been proven so well that any doctor who fails to use it, or any patient who refuses to have it used, is looked upon as criminal. It should be given at the earliest possible moment in the disease. The longer you wait the more damage the disease germs do before the antibodies in the antitoxin can overcome them. The following figures show the value of giving the antitoxin early. In 500 cases

Antitoxin given 5th day of disease, 18 out of 100 died.

Antitoxin given 4th day of disease, 16 out of 100 died.

Antitoxin given 3d day of disease, 11 out of 100 died.

Antitoxin given 2d day of disease, 4 out of 100 died.

Antitoxin given 1st day of disease, none out of 100 died.

Our valuable figure is the last one: of the 100 who received antitoxin on the first day of the disease none died. Toxin-antitoxin is given to the well child to prevent him from having the disease. Antitoxin is given to the child sick with diphtheria to help it get well of the disease.

Certainly nobody wants to have smallpox, typhoid fever or diphtheria. If they can be prevented, then why do we have them? The people who have them fall into three classes, so far as vaccination is concerned: (1) Those who are intelligent and honestly mean to be vaccinated but are busy and neglect it until they unfortunately take the disease. (2) Those who are honest, but ignorant and do not know about vaccination; or knowing about it, fail to see the importance of it, and die of their ignorance. (3) Those who know about it but do not believe in it and are openly opposed to it, talking their opposition to other people to make them believe as they themselves do. In time these people will be killed off by the disease which they refuse protection from. It is fast coming to be a reflection upon a person to have smallpox, typhoid fever or diphtheria. Vaccination will prevent them. People are finding out what it means to have this protection, and the sanitary intelligence of a community is judged by the number of cases of these diseases it has. An intelligent community can be vaccinated and with proper sanitation can remain a well one from these diseases if it will keep ignorant, careless people out of it or make them be vaccinated when they come into it. The stock of the race actually improves itself by preserving the intelligent and weeding out the ignorant. It is nature's way. You select the best corn for seed, and feed the nubbins to the hogs and chickens. We can be people whom nature selects for seed or we can be nubbins which we feed to the germ of smallpox, typhoid fever and diphtheria.

Every one can protect himself against these diseases by vaccination.

Your family doctor will vaccinate you or will send you to some one who will. It is a sound business proposition for you to insure yourself against the expense of the sickness and loss of time from work, as well as against the risk of life, from these diseases by being vaccinated.

ADDENDA

"The United States Public Health Service advises the following procedure in order to secure the best results from vaccination and to prevent possible complications. The freshest possible vaccine should be obtained. All vaccine packages, pending use, should be kept in a metal box in actual contact with ice. Vaccination should never be performed by cross-scratching or scarification, but by one of the methods described below. If a prompt "take" is very necessary, as in case of direct exposure to smallpox, or if the first attempt has been unsuccessful, three or four applications of the virus should be made, but the insertions should be at least an inch apart. Whichever method is used, a control area may be first treated similarly, but without the virus, in order to estimate the amount of pressure necessary for insertion and in order to demonstrate a possible early immune reaction in previously vaccinated individuals. The skin of the upper arm, in the region of the depression formed by the insertion of the deltoid muscle, should be thoroughly cleansed with soap and water if not seen to be clean, and in any case with alcohol or ether or sterile gauze. After evaporation of the alcohol or ether, a drop of the virus should be placed upon the cleansed skin. To expel the virus from a capillary tube, the tube should be pushed through the small rubber bulb which accompanies it, wiped with alcohol, and one end broken off with sterile gauze; the other end may be broken inside the rubber bulb. The hole in the latter should be closed with the finger as the bulb is compressed to expel the virus. The under surface of the arm is grasped with the vaccinator's left hand so as to stretch the skin where the virus has been placed. The skin is kept thus stretched throughout the process.

METHODS

(a) *The Method of Incision, Linear Abrasion.* By means of a sterilized needle or other suitable instrument, held in the right hand, a scratch, not deep enough to draw blood, is made through the drop of virus, one-quarter of an inch long and parallel with the humerus. The virus is then gently rubbed in with the aid of the needle or other smooth, sterile instrument. Some blood-tinged serum may ooze through the abrasion as the virus is rubbed in, but this should not be sufficient to wash the virus out of the wound.

(b) *The drill method.* A sterile drill, such as is used for the von Pirquet cutaneous tuberculin test, shaped like a very small screw driver with a moderately sharp end not more than 2 millimeters (1-12 inch) wide, is held between the thumb and middle finger, and with a twisting motion and moderately firm pressure, a small circular abrasion, the diameter of the drill, is made through the drop of virus; this should draw no blood.

(c) *The Multiple Puncture Method.* A sterile needle is held nearly parallel with the skin and the point pressed through the drop of virus so as to make about six oblique pricks or shallow punctures, through the epidermis to the cutis, but not deep enough to draw blood. The punctures should be confined to an area not more than one-eighth of an inch in diameter. With methods (a) and (b) it is advisable to expose the arm after vaccination to the open air, but not to direct sunlight, for 15 minutes before the clothing is allowed to touch it. With method (c) the virus may be wiped off immediately.

The original vaccination wound should be made as small as possible, and all injury to the vaccinated arm should be guarded against. Any covering which is tight, or more than temporary, tends to lacerate the tissues during the "take." This is to be avoided. No shield or other dressing should be applied at the time of vaccination. Customary bathing and daily washing of the skin may be continued, so long as the crust does not break. The application of moisture to the vaccinated area should not be enough

to soften the crust. If an early reaction of immunity is to be watched for, the patient should report on the first, second, fifth, and seventh days after vaccination. Otherwise, the patient should report on the ninth day, or sooner if the vesicle, pustule or crust breaks. Every effort should be made to prevent such rupture. However, should the vesicle, pustule, or crust break, and the wound thus become open, daily moisture dressings with some active antiseptic, such as mercuric chloride or dilute iodine (one part tincture of iodine in nine parts

of water) should be applied. Under no circumstances should any dressing be allowed to remain on a vaccination wound longer than 24 hours, and no dressings should be applied so long as the natural protection is intact. On account of possible fouling by perspiration and to lessen the chance of exposure to street dust, primary vaccination should be performed preferably in cool weather. A child should be vaccinated by the time it has reached the age of 6 months, and the operation should be repeated at about 6 years of age and whenever an epidemic of smallpox is present."

THE RELATION OF EYE, EAR, NOSE AND THROAT TO HEALTH

The diseases of the eye, ear, nose and throat have become a well defined specialty in medicine. The diseases of the eye and ear tend to remain confined to the eye and ear, while those of the nose, and particularly those of the throat, tend to distribute themselves to other parts of the body. But sight, hearing and smell are special senses which receive information for the brain from the outside world, and if the eye, ear or nose are diseased the happiness and usefulness of the individual are badly handicapped. So the diseases of all four organs are immensely important.

The eye is a small camera. It takes pictures for the brain. Its various positions for getting different views are determined by six muscles which move it around in its socket. It is kept clean, in order to get clear pictures, by the tears which constantly wash it. And it is protected by the eyelids and eyelashes.

A description of all the diseases of the eye would be too long to undertake here, but some of the more common symptoms of important eye diseases, which should cause one to have his eyes seen by a doctor, are as follows:

(1) If the eye becomes red, painful and runs water. If the patient is a baby no time should be lost. Twenty-

five per cent of the blindness in children is caused by an infection (ophthalmia neonatorum) which begins in this way. If the red, painful, watering eye of any one is only "pink eye" that affection is contagious, often runs in epidemics, and leaves many weak eyes behind it.

(2) If a foreign body (dirt, dust, steel) sticks to the cornea (over the colored part of the eyeball) it should be taken to a doctor for removal. An awkward move, wounding this delicate part of the eyeball, might cause an ulcer which, after it heals, leaves a white scar, interfering with sight.

(3) If a child, when it starts to school, becomes cross-eyed, or if occasionally an eye is crossed for only a short period of time, or if the eyes run water, or if the child cannot read long without rubbing the eyes it should be taken to a doctor and have the proper glasses fitted. This will likely prevent the child from becoming permanently cross-eyed, and will keep it from getting tired, nervous and irritable from eyestrain. In adults many headaches are due to eyestrain.

(4) In a person of middle age or past, aching pain in the eyeball, with or without disturbance of vision, should cause him to go to a doctor. Two serious diseases, which usually end in blindness, with, sometimes, the

need for removal of the eyeball, begin in this way. Early treatment may prevent their bad results.

(5) If a person develops spots before the eyes, which remain there, usually with headache, he should go to a doctor and have a thorough examination, including that of his blood pressure and his urine. It may save him from apoplexy or uremic poisoning.

(6) A child or a young person, developing light clouds in the colored part of the eyes, should go to a doctor and have his blood and possibly his spinal fluid examined for a blood disease.

(7) Practically everybody knows about cataracts and pterygia. These develop slowly, are not particularly dangerous, and are cured by operation, with, usually, a useful return of sight.

Points to be noted in the general care of the eyes are: Do not read in bed. Do not read in the bright sunlight or in a flickering light. If you get something in your eye, do not rub it. If, when you read very much, your eyes burn, smart, or become inflamed, see your doctor and follow his advice.

Of all the blindness in the United States, nine out of ten are blind from one of two causes: (1) ophthalmia neonatorum; or (2) from the uncorrected eye defects of school age. Ophthalmia neonatorum causes one out of six of these. It is a disease caused by a germ which gets into the baby's eyes while it is being born. If the eyes are carefully cleansed with one per cent silver nitrate immediately after birth, this disease can be prevented. All doctors and midwives should do this. There are 10,000 dependent blind people in the United States today because this was not done. The remaining five out of six are blind from diseases which could have been prevented if they had been treated early enough. Every year there should be a thorough, systematic examination of the eyes of school children. To set aside the question of blindness, many children who have credit for good eyes, but who have never been examined, do not have a fair chance in school, because of eye defects. A child who strains and squints at the blackboard attracts no particular attention, and if he fails to

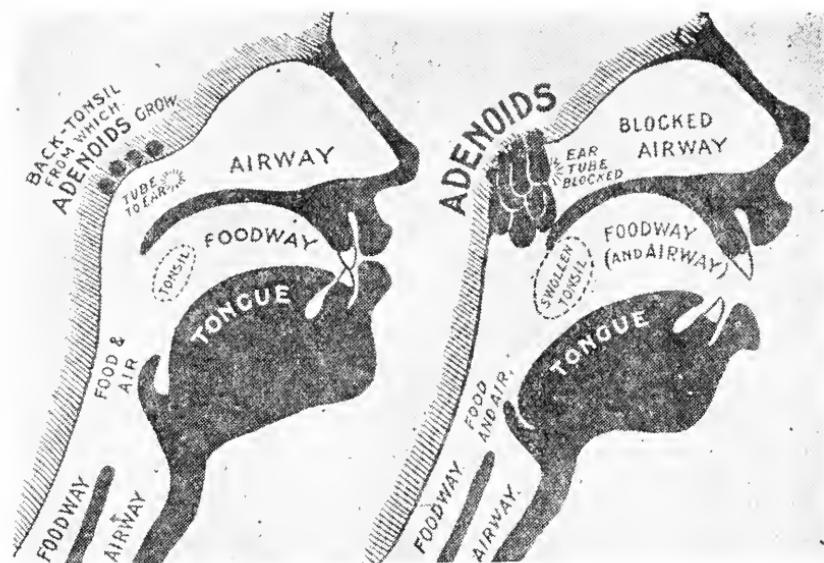
learn everything on the blackboard, or even in his books, he is considered lazy or stubborn. Recently, 91 children were examined in a country school in North Carolina: 13 complained bitterly of headache and of being tired all the time. The teacher complained that they were "lazy," "hard-headed," "stubborn," or "wilfully intractable." When examined, they were found to have serious eye defects. When these were corrected, ten of them became tractable children, showed improvement, and some made two grades during the remainder of the session. Sometimes a child with defective vision will complain that "the lines run together."

If the eyes of all babies were cleansed with one per cent silver nitrate immediately after birth, and the eyes of all school children were examined yearly and the defective ones properly treated, 90 per cent of all blindness could be prevented in one generation.

EAR

The ear is divided into three parts—the outer, which extends from the outside of the head inward to the ear-drum; the middle, which extends from the ear-drum to the wall of the internal ear, or third part, which lies in the bony wall of the skull.

The part of the ear in which we are most interested is the middle part. It is the part in which most of our ear trouble takes place. It is where abscesses (risings) form. This part has air in it, which comes up from the throat through a tube which connects the ear with the upper part of the throat. This tube (the eustachian tube) is very important. If it becomes closed, we cannot hear as well, and in addition still more serious troubles may follow. Most of the ear troubles come from this tube being stopped. If we have a cold or a sore throat and the infection goes up the tube to the ear, the tube becomes closed and an abscess forms in the ear. Children have more ear abscesses and running ears during the winter and early spring months, when they are having more colds and sore throats, than at any other season of the year. The tonsils and adenoids are situated near the openings of these tubes, in the upper



throat, and if they become too large, without being diseased, they may close these openings and cause partial deafness. And if the tonsils and adenoids become diseased, the disease can easily go up to the eustachian tubes and produce disease in the ears.

When trouble begins in the ear, usually, the first symptom we notice is earache. A doctor should be seen then. If an abscess is forming, the ear-drum should be cut to let the ear run. If the abscess is allowed to wait until the ear-drum bursts, a large, jagged hole is made in the drum, which may leave a hole when it heals, with some deafness resulting. If the drum is cut, the opening is narrow and even, and it will heal again, when the abscess is well, with less damage to the ear, and usually with better hearing resulting than if the abscess is left to burst and drain itself.

If the infection from the abscess in the middle ear extends backwards into the mastoid process, the area just behind the ear, the condition becomes serious. From here it can easily spread to the brain, with death as a result. If the mastoid area becomes tender whenever there is ear trouble, a doctor should be called immediately. If mastoiditis is developing, an operation may be necessary at once. Symp-

toms for which one should see a doctor, then, are deafness, earache, discharge from the ear, and immediately upon the development of severe headache, with tenderness behind the ear.

The nose extends from its front openings above the mouth backwards to the upper part of the throat. It is divided into two cavities by a septum, and from each outer wall three curved, scroll-like shelves of thin bone, the turbinates, extend across toward the septum, but not against it. The walls and the turbinates are covered by moist mucus membrane containing many hairs. This makes the nose an irregular, crooked canal, with a warm, moist surface for the air to pass over. All air going into the lungs should be clean and warm, and nature designed the nose to do this, and planned for all air to be taken in through the nose. In the nose, also, are the special nerves of smell.

If there is some condition in the nose which prevents the air from passing through it, and it must come in through the mouth, bad effects may naturally be expected from the condition. Exclusive of bad colds, during which time there is usually more or less temporary obstruction to breathing through the nose, the common causes of nasal obstruction are ade-

noids, deflection of the septum, enlarged turbinates, and nasal polyps. Inability to breathe through the nose, catarrh, or asthma are the symptoms which usually take the patient to the doctor. When the doctor examines the nose and finds out what is causing the obstruction or irritation, he then treats the condition which he happens to find according to what it needs; adenoids or polyps are removed; enlarged turbinates shrunk or partially removed; and deflected septum resected.

The most frequent and important cause of nasal obstruction which concerns the greatest number of people is adenoids in children. About 10 per cent of all children have adenoids to some extent. This disease usually begins about the second, third, or fourth year, increases in severity up to the eighth, ninth, or tenth year, and then decreases, possibly disappearing between the eleventh and fourteenth years, but during its existence the disease may mar the child's features, stature, efficiency, and character for life.

Adenoids are small swellings or little tumors that grow in the throat just above the back of the opening of the nose into the mouth, and in front of the opening of the two small tubes by which the ears are connected with the upper part of the throat. These little swellings or tumors are reddish-gray in color, soft and slimy in texture, and vary in size from that of a pea to a mass that almost completely fills the upper part of the throat.

The harm done by adenoids depends upon their size, location, and whether or not they are treated.

(1) They interfere with breathing. Normally, we take in the air (inspiration) through the nose, keeping the mouth closed. By passing over this surface, the air is warmed and much of the dust, dirt and germs in the air is filtered out on this sticky, mucus-covered wall, so that the air entering the lungs is warmer and purer than it would be if breathed in through the open mouth. We can readily see that if the adenoid growth in the back of the throat enlarges and grows over or into the back opening of the nose, it interferes with breathing through the nose, and forces the child to breathe

through its mouth. A child who habitually breathes with an open mouth becomes what is known as a "mouth-breather." The air reaching the lungs in an unpurified condition predisposes such a child to frequent attacks of cold, bronchitis, and pneumonia; and, furthermore, with part of its air canal obstructed, the child does not get into its body as much air as the normal child consumes. Air is one of the important foods of the body, the three kinds of food being air, water, and solids. Therefore, a child with its air food cut down doesn't grow as rapidly or as strong as a child that gets a sufficient amount of air food, or oxygen. This low resistance, this weakened condition, is another reason why the child with adenoids is more susceptible to diseases in general than is a normal child.

(2) The child with adenoids has an altered voice. The upper part of the throat, where adenoids grow, gives the quality known as resonance to the voice; therefore, when that part of the throat is diseased with adenoids and more or less filled up, the voice loses that quality. The speech is stuffy; the child, in pronouncing "teeth," says "teef"; in pronouncing "song," says "sogg"; in pronouncing "common," says "cobbed"; and in pronouncing "nose," says "dose." Instead of saying "Spring is coming," the child says "Sprig is cobbig," etc.

(3) The child's nose, being more or less diseased and especially subject to colds, loses to a large extent the sense of smell. We all know that when we have a cold and lose the sense of smell, we nearly always lose, to a certain extent, at least, our sense of taste. So it is with a child with adenoids—the senses of smell and taste are largely impaired. Appetite depends to a considerable extent upon our ability to enjoy food, to taste it; so adenoids, through interfering with taste, interfere with appetite, and, therefore, with desire for food, with amount of food consumed, and with the digestion of food. In these ways they interfere again with the general growth and strength of the body.

(4) Adenoids produce a peculiar facial expression. With the back part of the nose obstructed, partially or completely, and the mouth used as the

breathing tube, the roof of the mouth slowly bulges upwards to enlarge the mouth for its additional task. Now, with the pushing of the roof of the mouth upwards, the arch of the teeth becomes more acute and bends, causing an overlapping of the teeth and a shortening of the upper lip. The nose, on the other hand, remains undeveloped, small, and narrow. The extra effort of the child to breathe causes an unnatural arching of the eyebrows. All of these effects give us, after the disease has become fully established, the peculiar adenoid expression—the open mouth, the overlapping teeth, the short upper lip, the narrow, small nose, the high-arched eyebrows.

(5) Adenoids cause disturbed sleep by interfering with breathing. The child, when awake, can use its voluntary muscles to assist in the breathing process, but when it goes to sleep the breathing becomes impaired or insufficient, thus causing the child to awake to put to work the additional muscles; hence the restlessness at night and the bad dreams of a child suffering from adenoids.

(6) Adenoids frequently interfere with hearing, causing various degrees of deafness. An adenoid growth, if placed over one of the eustachian tubes opening from the middle ear into the top of the throat, will prevent that ear from receiving air from the back of the throat, and, when the air to the ear is cut off, the ear fails to hear properly. An adenoid growth may be so small and at the same time so placed with reference to the ear tubes as not to cause any symptom, except deafness. Deafness, therefore, always suggests an examination of the throat. It not infrequently happens that children with adenoids, in addition to a certain amount of deafness in one or both ears, develop earache or abscess of the ear, on account of the ears becoming infected through the obstructed and diseased tubes.

If a child has adenoids they should be removed. If a child is under eight or nine years of age, the harm will almost certainly increase and, perhaps, the injury will become permanent. The operation for adenoids is relatively simple, and the danger is not much greater than the danger of an anaes-

thetic. In other words, the treatment, as compared with the danger of leaving the adenoids alone, is a minimum danger compared with a maximum danger. Take your child to some physician who is known to treat adenoids, or if convenient, to a nose and throat specialist. Do it now.

The tonsils are two fleshy tumors, each normally about the size of the end of the thumb, situated one on each side of the throat, and are seen just above the back of the tongue when the tongue is depressed to bring them into view. The tonsils may stick out in the throat cavity and look large or they may be buried in the throat wall and look small and yet be the same size in both cases. So if there is trouble which the tonsils are suspected of causing it does not mean that there are little or no tonsils because little or none are seen. They may be buried out of sight in the wall of the throat.

In the tonsil are a number of pockets or crypts, as they are called, which open on the surface of the tonsil. The crypts are lined with the mucus membrane which covers the tonsil so that something may be in the pocket of the tonsil and at the same time not be inside the tonsillar tissue.

The purpose of the tonsils has not yet been clearly made out. Their presence would seem to imply that they have one but it is known that no serious harm results from not having them. In some people they shrink to nothing and in others big or diseased ones are removed with no bad results. So we know that we can do very well without them. But the fact that one has tonsils is no reason why they should be removed. But since it does no harm to remove them they should be removed if they are doing positive harm. There are three conditions which should cause them to be removed: (1) If they are so large that they crowd the throat and interfere with swallowing or interfere with the tubes leading to the ears and cause deafness; (2) if there are repeated attacks of severe tonsillitis or peritonsillar abscess (called quinsy); (3) if there are signs of the body having germs and poisons in the blood, as in some cases of rheumatism, heart or kidney disease, and it cannot be made

out where the germs are coming from, the tonsils should be removed.

The reason why apparently healthy tonsils should be removed in such cases is as follows: One of the pockets or crypts of a tonsil in which germs grow in an attack of tonsilitis may become sealed off at the mouth on the tonsil surface. The tonsil looks all right on the outside but inside there is a small abscess. This abscess eats through the wall of the crypt into the tonsillar tissues and the germs are fed into the blood stream and carried by the circulation all over the body. This tonsil would look healthy from the outside but when it is removed and the inside examined it would be found to contain this small hidden abscess which has been a spring feeding germs and poisons to the rest of the body.

The two common sore throats are acute follicular tonsilitis and diphtheria. In both of these there is a light colored exudate on the tonsils. In follicular tonsilitis the exudate is usually yellowish in color and arranged in patches. In diphtheria the exudate is usually a gray membrane on the tonsils or some other part of the throat. Every sore throat should be looked at. This is easily done by

tilting the head backward in a good light and pressing the tongue down with the handle of a spoon. The spoon should then be dropped into boiling water and care should be taken to keep the patient from coughing into your face during the examination. If the tonsils or any part of the throat have any exudate on them the child should be kept at home and it should be seen by a doctor immediately. If it is diphtheria it should have diphtheria antitoxin as soon as possible.

Defects of the eyes, ears, nose or throat in childhood are a great barrier to growth and development in both body and character. The children in school who are backward from these defects are not only a loss to themselves but they hinder the progress of the healthier ones in the class who are capable of going ahead. Everyone dislikes discomfort. And when a child has eyes which give him headaches or make him nervous when he studies he will be cross when you try to make him study. And a child dull and depressed with adenoids cannot be very ambitious. These are the children who are to be the men and women of tomorrow. What kind of citizens shall they be?

TUBERCULOSIS

Tuberculosis is a disease seen most frequently affecting the lungs of people of late youth and early middle age. Here it is commonly called consumption. It is seen in children affecting the glands, bones and joints, where it is often called scrofula. It is caused by a germ and affects those with faulty habits of living. It is curable in the early stages by adopting good habits of living. In the late stages it is often hopeless. But, since the disease is caused by a germ and by habits of living, which can be changed, it is preventable.

In North Carolina tuberculosis causes one of every eight deaths and one of every three preventable deaths during the wage earning period of life. It is killing more people in the United States than any other disease. It is

killing more every four years than were killed during the Civil War, occupying an equal period of time. Why does such a devastating disease cause no more alarm and no more effort to stop it? We get excited about smallpox, cholera, yellow fever or a war because they are spectacular. But figures show that tuberculosis kills as many people in the United States every six months as yellow fever has killed in 115 years. Tuberculosis is a familiar disease, working quietly, saving us the shocks of sudden tragedies; but a summary at the end of the year shows that, within that period, in North Carolina, the number of people, mostly of wage earning and family supporting ages, that have been so quietly eliminated, is 3,000. It is

our most devastating disease and it is preventable.

It was once thought that tuberculosis was hereditary—that the parents passed the disease on to their children through their "blood." This is now known to be a mistake. The disease often runs in families, but it does so for the same reason that those most closely associated with any consumptive are most likely to take it. Members of a family have much the same habits of living and are closely associated so that they keep one another infected and the disease runs in the family. In many families where a consumptive member is taught how to live without spreading his germs no other member takes the disease.

It was also once thought that tuberculosis was incurable. But this was because it was not recognized until the disease had almost consumed the patient (hence the name consumption) and he had no strength left with which to fight it. We are learning to recognize its early signs and if treatment is begun in the early stages it can usually be cured. Of the people whose bodies are opened and examined after death, many of those who die from other causes show healed scars from old tuberculosis in their lungs. This means two things: First, that they had tuberculosis which got well. Second, that many did not know it when they had it. What happened was something like this: From sickness or overwork they had become run down. There may have been deep colds or winter coughs or loss of appetite and weight, which improved after a rest or some special attention to the health. During this run down period there was a tuberculous lesion which healed with the improvement of the general health. If these people had not been careful of their health at their run down periods they would have developed tuberculosis on a consumptive scale. Tuberculosis is therefore curable.

The average death age from tuberculosis is 35 years. The reason for this is plain. It is the time of life when people are giving most of themselves to the wear and tear of hard work and the raising of families. They think of themselves less and neglect

their health. Their vitality runs low and small tuberculous lesions, which they might never have known that they had, develop into advanced tuberculosis before they recognize anything serious.

In addition to small tuberculous lesions, in many, which may not attract attention, all of us are frequently taking germs into our bodies on inhaled dust from dried sputum, coughed or spit by people who may not know that they are tuberculous. Why then, do not all of us have tuberculosis? There are two factors in the cause of the disease: (1) the strength of the germs and (2) the strength of the person. If a strong man takes in weak germs his body will likely kill them. If a weak man takes in strong germs they will likely grow and produce the disease. The same rule holds in the cure. The earlier treatment is begun, the smaller the amount of disease and the greater the strength of the patient and, therefore, the more likely his recovery. The later treatment is begun, the greater the amount of disease, the weaker the patient and the more unlikely is his recovery. The fresher the germs from the patients' sputa the stronger they are. The better our health, the stronger our resistance to them. We cannot choose the germs to be fought so it behooves us to keep ourselves in the best possible health, and to treat the earliest symptoms.

It is of the utmost importance to recognize the early symptoms of the disease. The late symptoms belong to a stage which too often cannot be cured. The popular picture of tuberculosis is a thin, pale, consumptive, with a racking cough, possibly spitting blood. This stage is usually incurable. But if taken early the disease is curable. Important early symptoms are: a constant tired and weak feeling; a steady and unaccountable loss of weight; loss of appetite with indigestion; a cough that lasts longer than three weeks; hoarseness which does not get well under ordinary treatment; unusual sweating at night; persistent pain in the chest or shoulder; attacks of pleurisy. Blood spitting is nearly always tuberculous. But many patients never have it. Absence of the germs in the sputum does not mean that the disease is not present.

They are present in advanced stages. Tuberculosis is the most common chronic disease, and particularly of the lungs. When chronic bronchitis lingers after pneumonia, grippe or a common cold be suspicious of early tuberculosis. Treatment will do no harm and it will restore your health and possibly prevent the disease from developing.

To get well of tuberculosis, do not depend on drugs. The doctor may occasionally use a medicine to increase appetite, control cough or hemorrhage, to induce rest, or to meet some such temporary symptom, but no medicine is given to act directly upon the germ. Quacks who advertise consumption "cures" are not trying to cure you so much as they are trying to get rich while you are spending your money trying to get well. The cause of the disease is a weakened resistance of the body, and only those things which build up the general health will cure it. These things are four—(1) rest, (2) fresh air, (3) food, (4) a cheerful mind. And, in time, the proper exercise.

When one finds that he has tuberculosis, he should, if possible, stop work entirely for six months and at once begin a rest cure at home on his porch or in his backyard; or if this cannot be done, rest in his room, with every window wide-open. He should rest constantly in the open air, and should lie down if he has any fever, and continue in bed until he has been without fever for at least a month. Then, gradually and cautiously, he can begin taking a little exercise—a few minutes only—slowly increasing each day, and stopping at once on the slightest return of fever, or if it causes him to get short of breath or to become tired.

In winter, wear enough warm, but light, loose clothing. Do not bundle up enough to cause perspiring. That will cause cold. Have the rooms kept clean by scrubbing with soap and water. Open wide all blinds and put up the window shades, so that the fresh air and sunlight can enter freely. The windows should be left open, summer and winter, day and night. Sleep, if possible, on a porch or in a tent. But if you have to sleep in a room, have every window open. Have plenty of warm, but light, bed clothing, and place the bed near one of the windows.

Get the best and most nourishing food you can afford. Eat meat at least once a day—preferably broiled or roasted—and take plenty of good, fresh milk, butter and eggs. A certain amount of fruit and green vegetables are needed for a well-balanced diet. Eat anything that you can digest. Drink plenty of water. Do not drink any alcoholic liquors.

Worry will break down the resistance of a well man. It is worse for a sick one. Happy surroundings, cheerful faces, and healthy minds and bodies in the house will be a great factor in the recovery of the patient and in keeping those around him well. His disease is curable, and he should keep this in mind and spend his time in the most pleasant manner possible.

The greatest possible care must be observed by the patient and by those attending him to keep the infection from spreading to others. The germ is in the sputum of the patient. All his sputum must go into a sputum cup, which is burned. A convenient one is a pasteboard cup in a metal container. The cup must be made so that flies cannot get into it. The patient must cover his mouth with a cloth or paper whenever he coughs or sneezes, and these must be burned. Avoid raising a dust. Have the room well screened and keep the sputum cups where flies cannot get to them. The patient's eating utensils, after use, must be scalded in hot water and washing soda and wiped dry. He should have his own, and use no other. All his linens and clothing must be boiled before being sent to the general wash. He should occupy a separate room, or at least a separate bed.

The prevention of tuberculosis depends upon maintaining a good standard of health and avoiding the sources of tuberculosis germs.

To maintain a high standard of health means to live more or less as a tubercular patient would. What will make him well will keep another well. Tuberculosis is a house disease. Tubercle bacilli cannot live in the fresh air and sunshine, but they can live in the air of closed rooms. Therefore, be outdoors as much as possible, and have plenty of fresh air and sunlight in the home. The North American Indian never had tuberculosis until he lived



NORTH CAROLINA SANATORIUM FOR TREATMENT OF TUBERCULOSIS

With a capacity of two hundred patients, the State maintains a modernly equipped sanatorium in the sandhills, where treatment may be received under the best of medical supervision. Interested persons may get full information by addressing the Superintendent, Sanatorium, N. C.

in the white man's houses. Eat plenty of plain, simple food, and drink plenty of pure water. Sleep eight hours every night, and avoid dissipation.

The ultimate source of the tuberculosis germ is the saliva of the patient. He may know that he has tuberculosis, or he may not. If he does not, he is all the more dangerous, because he will be the more careless. When he coughs, with the mouth uncovered, the fresh, virile germs may be inhaled from the fine spray of droplets which he throws into the air, or they may be inhaled from the dust which brings them up from the floor after they have fallen and dried. When he spits, flies may feed upon the fresh sputum and carry the germs to food which they feed upon next. The promiscuous cougher and spitter is a disease spreader. He spreads it in the home, shop, factory, store, and sometimes on the street.

An additional source of infection, to children in particular, is the milk from tuberculous cows. The county should see that all milk sold within its limits comes from nontuberculous cows. A tuberculous mother usually gives the disease to her baby if she suckles it.

The conquest of tuberculosis is for the community as well as the doctors. It is more a matter of education than of medicine. Hygiene and sanitation must be thoroughly drilled into the children at school. Laws against spitting must be enforced to cultivate a proper public sentiment against it. The county nurses should be complimented upon their excellent work in instructing patients as to how to make them-

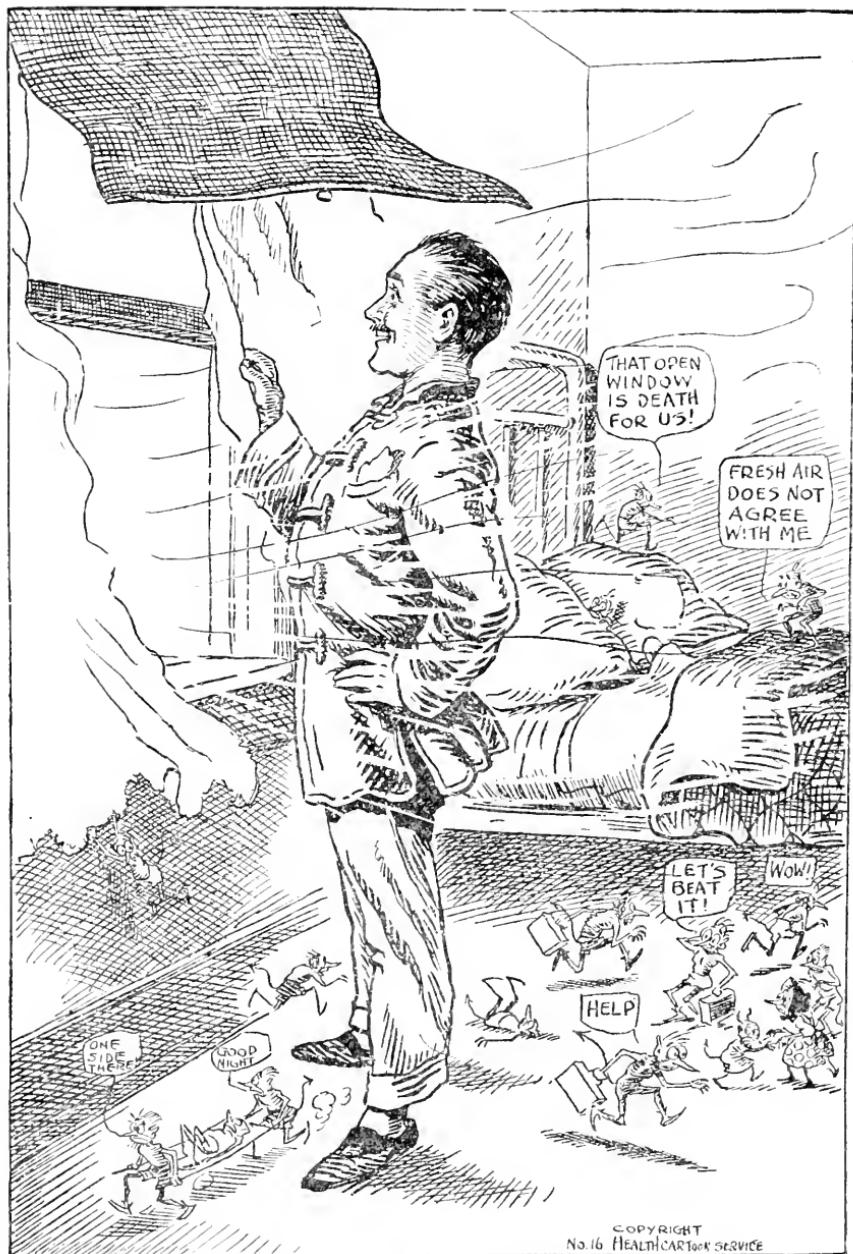
selves safe for their families and friends. Everybody should read all the publications on the disease by the various boards of health.

The cure and prevention of tuberculosis rests, in the end, upon the conduct of every individual person. Tuberculosis is a slow disease. It might be called an error in the way of living. It develops slowly, after repeated exposures to the disease, rather than rapidly, after a single exposure. And it is cured by patient and careful correction of the habits of living for life, rather than by an intensive course of treatment for a limited period of time. The arrested case cannot discard his good habits, which he practiced during his treatment, without dangers of a relapse. And the well person cannot remain well unless his habits of working, eating and sleeping are good. If he is careful only when he knows that he is in danger, he is not protected from the many sources of germs that no one knows about. It is only the habit of good sanitation and hygiene that will give protection all of the time. These good habits, in addition to keeping the germs out of the body, will build up a strong physical constitution, which will kill the germs whenever they do happen to be accidentally taken into the body.

The habits to be relied upon to cure tuberculosis and to keep it from ever developing are: plenty of fresh air, out of doors, plenty of nourishing food, and plenty of sunlight, out of doors or through an open window, straight from the sun.

BEWARE OF MEASLES

During the latter part of March there has been an unusual prevalence of measles. Many parents still feel that their children must have all the common communicable diseases, and that the sooner they have them the better. On this theory some parents even deliberately expose their children to infection. A greater mistake could not be made. Measles is especially dangerous because of the frequent impairment of sight and hearing which follows, and because of the large number of cases that prove fatal. Guard your child against measles and all other contagious diseases just as much as possible.



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No. 16 HEALTH CARTOON SERVICE

Nature's Best Ally—Fresh Air



The

The Health Bulletin

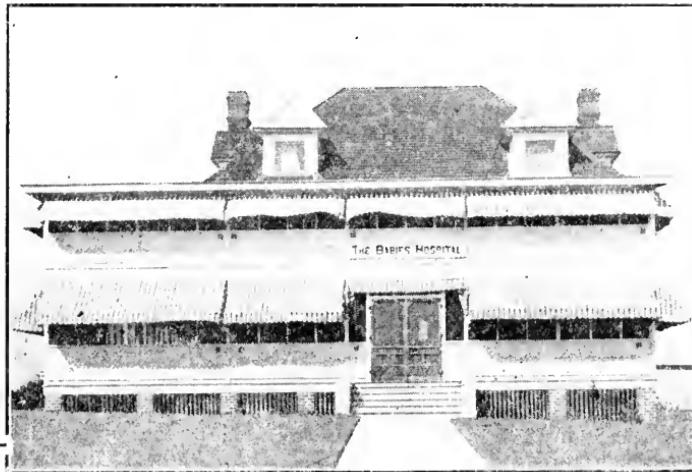
Published by THE NORTH CAROLINA STATE BOARD of HEALTH

This Bulletin will be sent free to any citizen of the State upon request

Vol. XXXVIII

MAY, 1923

No. 5



THE BABIES' HOSPITAL

The Babies' Hospital on Wrightsville Sound between Wilmington and Wrightsville Beach is a public hospital for sick babies. It is situated on the sound in order to have the benefits of salt air and sea breezes with none of the disadvantages incident to a location on the ocean front. Its purpose is to treat sick babies, and through its excellent milk feeding station to keep well babies from getting sick. It is open to any physician, and serves a nearby population of at least 200,000 people.

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J. S. MITCHENER, M.D., Chief of Bureau of Medical Inspection of Schools.
K. P. B. BONNER, M.D., Chief of Bureau of Maternity and Infancy.

FREE HEALTH LITERATURE

The State Board of Health has available for distribution without charge special literature on the following subjects. Ask for any that you may be interested in.

WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SPIT PLACARDS	ADENOIDS
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
TUBERCULOSIS	EYES	TYPHOID FEVER
SCARLET FEVER	FLIES	DIPHTHERIA
INFANTILE PARALYSIS	COLDS	PELLAGRA
CARE OF THE BABY	TEETH	CONSTIPATION
FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREAL DISEASES
TUBERCULOSIS PLACARDS	MALARIA	CATARH

FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The Health Bulletin is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for The Bulletin each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.



THE Health Bulletin

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ANNOUNCEMENT

A number of changes in the administrative staff of the State Board of Health became effective on March first. Dr. G. M. Cooper, who has been a member of the staff for the past eight years, was appointed Assistant Secretary of the Board, becoming responsible for the educational work and Editor of THE HEALTH BULLETIN. The Bureau of Epidemiology was discontinued as a separate administrative unit, its functions being combined with the Bureau of Vital Statistics under the direction of Dr. F. M. Register. Dr. J. S. Mitchener, formerly State Epidemiologist, became director of the Bureau of Medical Inspection of Schools, succeeding Dr. Cooper. The Bureau of County Health Work was discontinued, its functions being merged into the office of the Secretary of the Board. To aid in the development of county health work the State was divided into five districts with the following division directors: Dr. E. F. Long, Dr. R. C. Mitchell, Dr. M. L. Ilsley, Dr. H. A. Taylor, and Miss Rose M. Ehrenfeld, R. N.

With regard to THE HEALTH BULLETIN, every effort will be exerted to maintain the previous high standard of this publication, and to continue to publish in simple, understandable language as much accurate, scientific information about the prevention of disease as possible. An earnest endeavor will be made to send out each issue as near the first of the month as possible.

SERVICE TO THE PEOPLE

WHAT THE STATE BOARD OF HEALTH HAS TO OFFER TO THE PEOPLE OF NORTH CAROLINA

The only reason for the existence of a State Health Department is because of a necessary service such a division of government must render to the State's citizens in the pursuit of health and the protection of life. In response to the growing demands of a great progressive state, and on account of the complexities of modern business, it has been necessary, in order to render efficient service, in an economical manner, to organize the work of the Board of Health into separate divisions with a responsible director at the head of each division. In order to set forth concisely and specifically just the character and scope of service and co-operation the State Board of Health extends to the public, the Editor of the Bulletin has asked the director of each department to prepare a statement carefully describing precisely what service his department is prepared to render. The publication of these articles should supply valuable information to the public and especially to the medical profession, health officials and organizations of teachers.

Any individual, organization, county or municipality, desiring additional information concerning any of the departmental activities described in the following papers or to avail themselves of the services offered, may obtain a prompt response by simply writing to the director of the particular department interested in, care of the State Board of Health, Raleigh, N. C.

I.

WHAT THE BUREAU OF COUNTY HEALTH WORK OFFERS TO THE COUNTIES

The Bureau of County Health Work offers to the counties of the State material assistance and expert advice. In this offer the Bureau seeks neither direction nor super-

vision over local health work. The Board of Health is definitely and firmly committed to the policy of improving health by educational appeal and assistance rather than by legal compulsion. The practice of legally requiring local governments to do certain things, a practice in general use in most of the states and used with respect to certain phases of government in North Carolina, is not necessary in work of the character of that which interests the State Board of Health. The health idea has enough merit in it to get it across to the public. It is not necessary to hold the nose of the public and make it swallow health. Failure to influence the average county to take reasonable measures for the protection of the health of its people is not due to any fault of the county; neither is it due to any inherent weakness or defect in the idea of health protection or advancement: the fault, nine times in ten, lies with the sort of salesmanship behind the idea. Physical salvation, like spiritual salvation, sells itself when properly presented. All that is needed, and this the Bureau of County Health Work attempts to supply, is to properly present the possibility and practicability of health protection and improvement and to offer enough assistance, in the way of material support and intelligent planning, to insure a good start.

The material assistance, which the Bureau of County Health Work has to offer, is \$2,500 annually to the county which establishes and maintains a full-time health department and which itself expends an equal sum. The material assistance of the Bureau is not conditioned upon who is to be elected health officer. The county selects its own health officer without any dictation—political, personal, or otherwise—from the State Board of Health. Only when the Bureau is requested by the county

authorities to assist in finding an available health officer, does the Bureau take any part; moreover, when the Bureau has found a health officer its function has ceased and the responsibility of selecting a health officer devolves entirely upon the county authorities. The Bureau helps to find, but it never selects. The material assistance of the Bureau is not conditioned upon the development of some particular plan of work. Each county may originate its own plan with or without the assistance of the Bureau of County Health Work, as the county may choose. The material assistance of the Bureau is conditioned upon the county health department keeping a record of the items of work which it performs, and reporting to the Bureau monthly what work it has accomplished with the funds expended, in order that the Bureau, which is responsible to the General Assembly and to the State for the funds which it has supplied the county, may account to the General Assembly not only for what was spent, but, which is far more important, for what was accomplished with the money expended.

The expert advice, which the Bureau of County Health Work offers to the counties, is supplied through a personnel of exceptionally well-trained health officers; moreover, these health officers are, through their contacts with county health departments that make use of them in the planning of their work and through the reports of work accomplished reported to them by county health departments, familiar with what is being accomplished in all the counties of the State having full-time departments, and with how the accomplishments of these departments are effected. The expert personnel of the Bureau is available at any time and all times to the county authorities, to the County Medical Society and other interested groups of citizens to confer with them in regard to the possibilities of improving the work of the local department.

II.

**WHAT THE STATE LABORATORY
OF HYGIENE OFFERS TO THE
MEDICAL PROFESSION AND
THE PUBLIC**

The work of the State Laboratory of Hygiene may best be understood by dividing it into three divisions: (1) the examination of specimens, (2) the supervision of water supplies, and (3) the distribution of serums and vaccines.

The chief examinations are the following: Throat swabs for diphtheria, sputum for tuberculosis, blood for typhoid fever, both by means of the Widal agglutination test and by culture, blood for the Wassermann test for syphilis, pus for gonococci, brains of dogs and other animals for rabies, specimens of faeces for intestinal parasites, blood for malaria, and spinal fluid for meningococci or other infection.

All these examinations are made entirely without charge, but reports are sent to physicians only. There are certain other examinations which clearly belong to the private practice of medicine; there is no more reason why the State should make gastric analyses or blood sugar tests, for instance, than that it should make a business of performing appendectomies. The line is at times hard to define but the distinction exists just the same. We have tried to solve the problem of tumor examination and urine analyses by charging a small fee. These examinations do not usually fall under the head of public health work but they occasionally do, and the laboratory is protected from abuse by the fee. It is manifest that the examination of specimens for life insurance is not a part of the work of a public health laboratory.

The examination of water is an important division of the laboratory work. It is recognized that an isolated examination of one sample does not give much definite information, but we have a system of regular and periodic examination of all public water supplies which works in harmony with an efficient engineering department under the control of the

Board of Health. This work has led to great improvements in the public water supplies and in the commercial bottled waters.

The third division includes the distribution of prophylactic serums and vaccines. Typhoid vaccine, Triple (Typhoid, paratyphoid A, and paratyphoid B) vaccine, pertussis vaccine and smallpox vaccine are distributed entirely without charge. Diphtheria antitoxin in 1000, 3000, 5000, and 10000 unit packages are distributed at twenty-five cents each, and prophylactic doses of tetanus antitoxin at fifty cents each. The complete Pasteur antirabic treatment accompanied with a good Luer syringe is supplied at \$5. Diphtheria toxin-antitoxin mixture is distributed at ten cents for three doses (one complete treatment). This mixture promises to be efficient in the prevention of diphtheria as the typhoid vaccine is for typhoid fever.

These nominal charges are not placed for the purpose of producing revenue, but as a protection against waste. Without the charge it is certain that many products would be ordered which would not be used, and if this should occur to any great extent we could not hope to supply the whole State.

The State Laboratory of Hygiene is at the service of every citizen of the State, but for the most part these services are of such a character that they must be rendered through the medical profession. In no sense does the laboratory take the place of the physician—rather it attempts to aid him in giving better service to his patients. There is probably not a community in the State, however remote, which is not served in one way or another by the laboratory. During the present year further extension of its service is planned.

III.

WHAT THE BUREAU OF SANITARY ENGINEERING AND INSPECTION OFFERS TO THE CITIZENS OF NORTH CAROLINA

The North Carolina State Board of Health, through its Bureau of Sanitary Engineering and Inspection,

offers the following service to the citizens of North Carolina:

Division of Sanitary Inspection

A field force of eleven sanitary inspectors whose duties are:

1. Enforcement of the provisions of the State Sanitary Privy law, requiring construction and maintenance of privies in towns and villages in accordance with the rules and regulations adopted by the State Board of Health under authority of Chapter 71, Public Laws of 1919. This service is available in all towns and villages, whether incorporated or unincorporated. The inspectors' jurisdiction under provisions of this law extends in all directions one mile from the corporate limits of an incorporated town or village, and one mile from the geographical center of an unincorporated village.

2. The inspection and rating of hotels and cafes. The jurisdiction of the inspector includes all hotels with more than 10 rooms for transient guests, and all cafes where tables and seating arrangements are such as to permit the serving of not less than 12 guests at any one time.

3. The inspection of all State institutions.

4. The inspection of all county jails.

5. The inspection of all State and county convict camps.

6. The distribution of information upon any of the foregoing subjects.

The above duties are carried out in accordance with a definitely arranged plan, in such manner as to cover the entire State, at least once every twelve months, but in case of conditions requiring immediate attention, any of the above items of service may be secured upon the application of any person.

Division of Sanitary Engineering

A force of three sanitary engineers, whose duties are:

1. Examination of all plans and specifications for proposed public water supply and sewerage systems and improvements, and approval of such features as relate to or may affect the protection of the public health.

2. Investigation of existing public water supplies and sewerage systems, advising the governing boards of the necessity of any improvements, alterations or changes in such systems that may be necessary for the better protection of the public health.

3. Advising with the engineer, representing the governing body contemplating improvements, with regard to the best means of protection or purification of public water supplies, or the disposal of sewage, for the better protection of the public health.

4. The instruction and advice of persons charged with the operation of water and sewage purification plants and devices for the purpose of securing at all times, for the protection of the public health, the greatest possible effectiveness that such plants and devices are capable of producing.

The above items of service are available upon the request of any governing body having in its charge the construction or operation of water supply or sewerage system serving the public, or upon application of any authorized representative of such board or governing body.

5. The distribution of information upon any of the foregoing subjects.

This service may be secured upon the application of any person. All of the service rendered by the Bureau of Sanitary Engineering and Inspection is available upon application, as cited above, and is furnished free of any charge.

IV

WHAT THE BUREAU OF VITAL STATISTICS HAS TO OFFER THE PEOPLE OF NORTH CAROLINA

As the State Treasurer has the financial interests of North Carolina to look after and by his books show the receipts and disbursements of the money of the people, so the Bureau of Vital Statistics shows the ebb and flow of the human family and the amount of sickness from certain diseases. This service is free to the people of North Carolina.

If you are interested in any particular county as to the number of

deaths by race, by sex, by age, or from any particular disease, just write the Bureau of Vital Statistics, Raleigh, N. C., enclosing stamped envelope and such information as is desired will be sent you. We have the same information tabulated for the fourteen (14) largest towns in the State.

If you are putting on a drive for sale of tuberculosis seals, or for the erection of a tubercular hospital in any county or city in the State, we can furnish you with the number of deaths from tuberculosis in that particular county or city.

Or, if you are thinking of employing a nurse to do maternity and infant welfare work in a county, we can inform you as to the number of births, how many white, how many colored, number of births attended by physicians, number attended by midwives, and how many stillbirths.

Or, if you are thinking of doing a piece of welfare work, we can tell you how many illegitimate white and colored births occur annually in any particular county, the number of married people dying under twenty-five years, etc.

Or, if you are a physician and want to locate in a particular county, we can give the number of births in a county, and number attended by physicians. We can give you the amount of sickness from contagious diseases in any particular county or city or the number of deaths from diarrhoea and enteritis and of mothers dying in the puerperal state.

If you are a manufacturing company and wish to establish a plant in any county, we can give you valuable information as to the health of this county, based on deaths from certain contagious diseases as compared to other localities in this and other states.

We can give great service to the legislators, by giving the number of people killed annually by trains, automobiles, firearms, burns, suicide, homicide, machinery, etc., and on these facts base laws for greater safety to the human race.

Insurance companies when called upon to settle death claims, can get a copy of the ORIGINAL death certificate of the decedent from the

Bureau of Vital Statistics. The Bureau of Vital Statistics of the State Board of Health is the ONLY holder of the original certificate. A copy from any other source is a copy of a copy.

Ex-service men filing claims for compensation can obtain copies of original birth certificates of their children.

Any one in North Carolina can, by enclosing a stamped envelope, and writing the Bureau of Vital Statistics, ascertain if the births of their children are registered, provided child was born since 1913, the year the Bureau was established. Or if your child was born prior to 1914, and you desire to have the birth registered, write to the Bureau of Vital Statistics, Raleigh, N. C., enclosing stamp and request a blank birth certificate. One requiring affidavit will be sent to you to be filled and returned to the Bureau of Vital Statistics and it will be registered.

Registration of births is probably one of the most far-reaching and important functions of your State Government.

Any one requiring or desiring a certified copy of a birth or death certificate can obtain same by sending the fee of fifty cents to the Bureau of Vital Statistics, Raleigh, N. C.

In return for the above service, the State of North Carolina only asks for the hearty co-operation of her citizens, both professional and laymen, and we promise you that the service will be constantly improved in response to such co-operation.

V.

WHAT THE BUREAU OF MEDICAL INSPECTION OF SCHOOLS OFFERS TO SCHOOL CHILDREN OF THE STATE

The Bureau of Medical Inspection of Schools offers to the citizens of the State the following:

(1) The State Board of Health school nurses are sent into a large number of counties every three or four years to inspect the school children for certain defects. The teeth, eyes, ears and throats are carefully observed. Attention is called to the

height and weight of the child as compared with the normal child. Counties are taken more or less in their order, but preference is given to those who request dental and tonsil and adenoid clinics. The nurse spends sufficient time in the county to visit each school. There is no cost to the county. The State defrays all expenses.

(2) Tonsil and adenoid clinics are conducted in counties after the inspection is carried out. For the clinic to be conducted in a county, an invitation signed by the members of the County Board of Health and the County Health Officer; also their choice of qualified specialists selected by them must be forwarded to the State Board of Health before arrangements can be made for a clinic. The nurse who carried out the inspection visits the county in the summer to get the children to the clinic and to make arrangement for a place to house the hospital. Children from families who can pay, are charged \$12.50, while those who are unable to pay the fixed fee are admitted free. The charge is simply to help defray the actual cost of the work, and so make the service possible.

(3) Free dental examination and actual treatment is offered to children between the ages of six and twelve years inclusive. All the work that the children need cannot be done, as correcting the position of teeth, filling permanent teeth when the nerves are exposed, etc., but careful attention is given to the six-year molars, treating temporary teeth by extracting, filling and cleaning, and a lecture on "Care of the Teeth." Visits are made to country, as well as town schools. When dental service is desired, one should write to the State Board of Health for details of the plan.

VI.

WHAT THE BUREAU OF MATERNITY AND INFANCY OFFERS TO THE PEOPLE

Since the organization of the Bureau of Maternity and Infancy of the State Board of Health in April, 1922, under the provisions of the

Federal Sheppard-Towner Act, many questions have been asked relative to what this Bureau had to offer to the people of North Carolina. To secure the funds appropriated by the United States Government it was agreed that they should be expended only for approved items of public health work having direct bearing on the promotion of the welfare and hygiene of maternity and infancy. To correct an erroneous impression that is prevalent, it is well to state that no direct subsidy is paid to any individual, as the law specifically prohibits this.

In conformity with the above policy, this Bureau has the following to offer to the people of the State:

1. It offers to a limited number of counties, where no county health department exists and until the available funds are exhausted, to assist in the establishment of a county unit to deal with problems affecting maternity and infancy; to be under the supervision of a whole-time nurse specially trained in maternity and infancy work. This Bureau will contribute \$1,250 toward the year's budget, conditional upon not less than a like amount being raised locally.

2. It offers to the prospective mothers of North Carolina, gratis, prenatal information through the medium of a series of nine letters extending through the period of pregnancy. These letters are supplemented by other pamphlets and literature dealing with this subject. Those desirous of this service should give their name, address and the approximate date of expected confinement.

3. It offers to the mothers of the State advisory literature dealing with all phases of the problems affecting the physical welfare of their babies. Send the name, address, and age of the baby.

4. It distributes without cost solution of silver nitrate to hospitals,

institutions, health departments, physicians and midwives.

5. It keeps a record of and has an investigation made of all cases of infected eyes in babies, as this Bureau is charged with the responsibility of the enforcement of the State laws relating to the prevention of blindness.

6. This Bureau has the supervision of the registration of midwives that is now required by law, and distributes literature to the midwives of the State. It assists county health departments and county nurses in securing midwives' conferences to elevate the general standard of proficiency of the midwives.

7. This Bureau offers special service in the way of general advice upon problems relating to maternity and infancy, but refers such cases to the family physician where indicated.

8. This department is in touch with nurses available for service, and assists health departments, counties and towns in securing public health nurses.

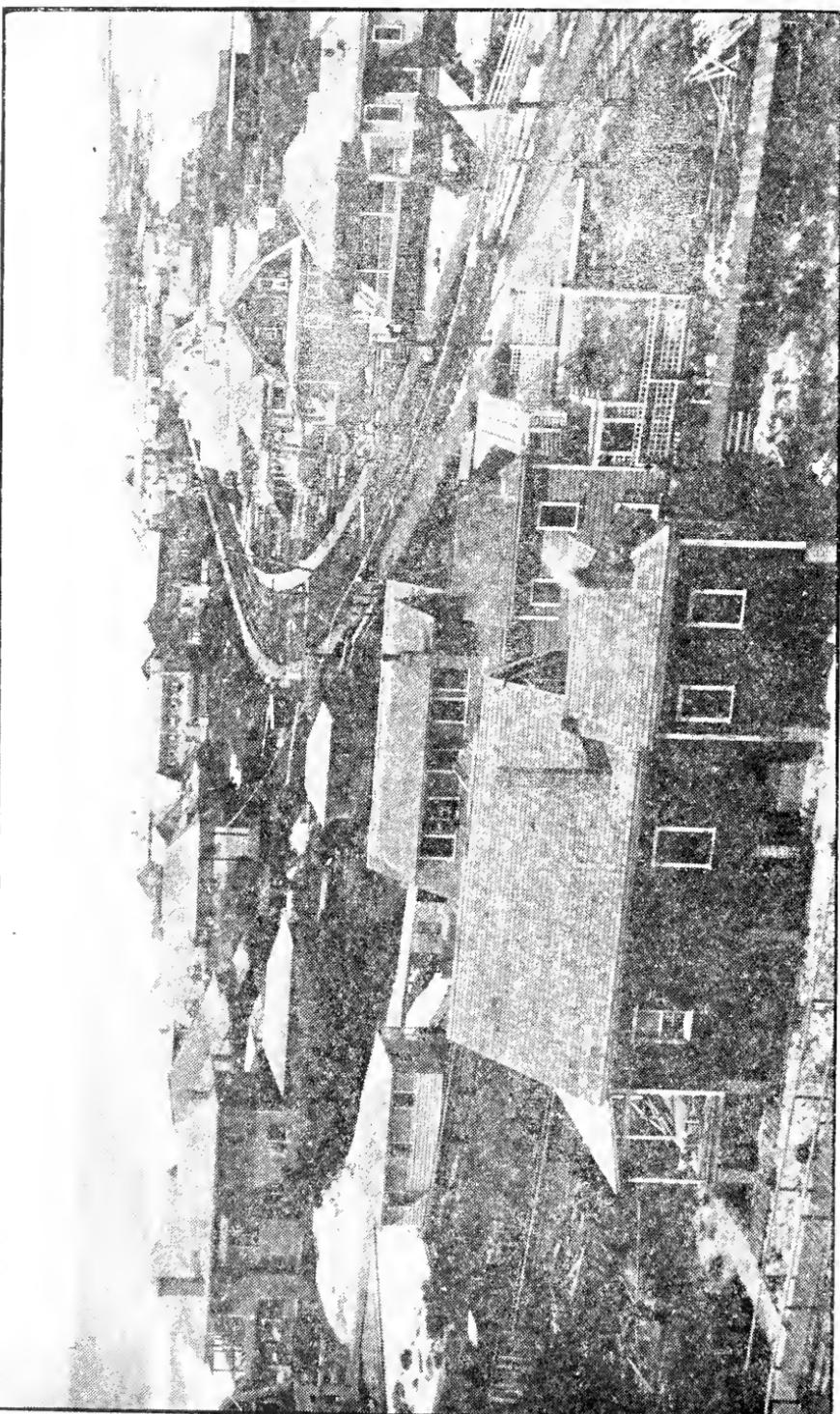
9. Sends speakers to address audiences upon questions of maternity and infancy.

10. Offers the assistance of this Bureau in the organization and conduct of baby examinations and advisory clinics. It will send representatives to assist in the supervision and conduct of the work.

11. The county health nurse organizes and instructs classes of Modern Health Crusade, Little Mothers' League, and Home Care of the Sick, and holds home conferences with mothers relative to themselves and their babies.

Further and more detailed information, relative to any of the above services offered by the department, may be secured by writing to the Bureau of Maternity and Infancy, State Board of Health, Raleigh, N. C.





Wrightsville Beach, nine miles east of Wilmington and just across the channel from The Baby Hospital. Wrightsville has long been the summer seashore playground for thousands of people from North and South Carolina and Georgia. It has an abundant supply of pure drinking water and is situated in New Hanover County, one of the first counties in the State to organize and maintain a first class Health Department.

KEEPING THE BABY WELL

BY

J. BUREN SIDBURY, M.D.,

Pediatrician to the Babies' and James Walker Hospitals,
Wilmington, N. C.

(Dr. Sidbury has crowded so much sound common-sense advice in this excellent article that we earnestly hope every physician and the parents of every baby under one year old, in North Carolina will read carefully and preserve for reference all through the summer.—Editor.)

1. Keep the Baby at the Breast.

One cannot properly advise how to keep the baby well without stressing first the importance of keeping the baby at the breast for the first nine months. Early weaning is responsible for more diarrhoea and gastro-intestinal disorders than any other five agencies combined.

Every one knows that breast milk is the ideal food for the infant, and even though the amount be scant the baby should not be deprived of that small amount. With breast milk the most illiterate can rear a big healthy baby, but if this same mother is deprived of breast milk for her baby the picture will be an entirely different one.

Before the baby is weaned from the breast because of insufficient milk supply, certain steps should be taken. First, the baby should be weighed before and after nursing to determine the amount of milk the baby gets from the breast. If this quantity is not enough then the baby should be nursed from both breasts at each feeding time, and if there is not a reasonable gain in the weight for one week then the second step should be taken—that is, after nursing both breasts the baby should be given a formula prescribed by the doctor. This feeding should be given immediately after the nursing, two, three or four times daily as the need requires. This routine should be followed in all cases before the baby is weaned.

2. Regularity of habits and of feeding is a very essential feature in successful feeding of babies.

The baby should have a regular routine and should not be handled any more than is absolutely necessary for the first six or eight months. He should sleep twenty hours out of twenty-four, and this the baby cannot do if he is carried around in the mother's arms all day.

A baby should never be fed more often than every three hours during the day and four hours at night. The longer the interval between feedings the less likely are you to have a vomiting baby or one with a gastro-intestinal upset. Normally it takes two and a half to three hours for the stomach to empty itself, and if food is added before the stomach is empty, trouble will sooner or later ensue. In the hot summer months the stomach and intestines of these little babies have a diminished tolerance for food and less demand should be made of them. If this law of nature is not followed, an explosion is very likely to occur. During the very hot weather dilute the baby's food one-third or one-fourth with boiled water and give all the plain boiled water the baby will take. At this time think more of keeping the baby well than of trying to make him gain one or two more ounces that week.

3. The Artificially Fed Baby.

(a) When breast milk is not to be had for the baby, then the next best food for the baby is cow's milk properly modified. Cow's milk must be obtained from an inspected and tuberculin-tested herd. (b) It should not be too rich, for babies do not take care of high fats in the hot summer months. If the milk is Jersey milk, the cream, or some part of it, should be removed—the amount removed should be directed by the attending physician. (c) All cows' milk, however clean, should be boiled from two to five minutes before giv-

ing it to the baby, from the first of May throughout the summer months. The doctor who feeds cow's milk raw to a baby under two years old through the summer months is inviting calamity, which will sooner or later befall him. ALL COWS' MILK MUST BE BOILED BEFORE GIVING TO THE BABY DURING THE SUMMER MONTHS. A baby should get at least one and a half ounces of cow's milk per pound of body weight each twenty-four hours, and should get three ounces of fluid per pound of body weight each twenty-four hours. This is the minimum requisite for their proper growth and development.

4. Dried Milks.

In the event that fresh cow's milk cannot be obtained for the baby, the next best food is some one of the dried milks. Either Dryco Dry Milk, which is skimmed cow's milk dried, or Klim Whole Milk, which is whole cow's milk with the water taken out, is good. These may be handled as cow's milk if one remembers that one level tablespoonful of Dryco dry milk to one ounce of water makes skimmed milk or its equivalent, and one level tablespoonful of Klim whole milk to two ounces of water makes whole cow's milk or its equivalent.

5. When to Wean the Baby.

The baby should be weaned some time between the ninth and fourteenth months. If the baby is twelve months old in July or August and has not been doing very well, it might be well to postpone weaning the baby till the fall of the year, but it is advisable to give two or three feedings of cereals and modified milk each day in addition to keep nutrition up to the proper state. When it is possible, I feel that it is better to wean the baby at nine months and get the baby started on a good substantial diet before the hot months come in. The average normal baby has enough iron stored up in the liver for the first six or eight months. After that time there is no reserve, and unless some iron is put in from outside sources the baby becomes anemic and undernourished. Iron is best supplied in the form of fresh vegetables such as spinach and

carrots cooked in plain water with a little salt. The water soluble substance is of greatest value.

The baby should be given water from the bottle from birth. This will teach him to take more water as well as to be of great help when you wish to begin weaning the baby. Babies that have never had anything but the breast for ten or twelve months are often very hard to get started on other foods, and if abrupt weaning of this type of baby becomes necessary during the hot months, you have a very difficult problem to handle and one that is often handled unsuccessfully. It is very undesirable to change the baby's feeding during the hot months. Changing from one cow's milk to another's has often been the cause of upsetting the baby. Whenever possible, the same milk should be continued.

Taking the baby visiting is, in most cases, an unpardonable sin. I am so often asked the question, how soon it will be before the baby can safely be taken to see the grandparents. I feel very strongly that the place for the baby for the first year at least is at home. If the grandparents or aunts wish to see the baby let them come, but keep the baby at home where he may be properly taken care of and where the general routine will not be disturbed.

5. Clothing.

Dress the baby lightly and have clothes loose enough for the baby to take exercise freely. Burn the abdominal bands as soon as the navel is sufficiently healed not to require a dressing. Tight abdominal bands cause the baby to vomit. It is well known that the abdominal band is never over the abdomen where it was put.

In the hot months give the baby three or four tub baths daily. This will assist in eliminating heat and in many cases prevent intestinal upsets caused from getting overheated.

DON'TS

1. Don't give raw milk in the summer-time.
2. Don't let baby eat between meals, but have regular feeding hours.

3. Don't let the child have coffee, tea or bottled drinks from the drug store.
4. Don't give store-bought ice cream. It is never made from boiled milk but is very often made from sour milk.
5. Don't feed the baby from the table.
6. Don't give the baby unboiled water during the summer-time.
7. Don't let the baby use a pacifier.
8. Don't put anything in the baby's mouth which has not first been boiled.
9. Don't give the baby candy.

THE HOUSE-FLY PROBLEM

It is probable that in the month of May more people are concerned about the house-fly pest than during any other month of the year, and they should be, because there is no doubt that the high sickness rate, at least among infants, in this month is due to infection carried by the fly. Dr. L. O. Howard, of the U. S. Government Service at Washington, and the foremost authority on the subject in America, has long ago designated the house fly as "the most dangerous animal that exists." In the April issue of *Hygeia*, the new journal of health published by the American Medical Association, Dr. Howard has a most valuable illustrated article on "The House Fly—Carrier of Disease." In his introductory paragraph to that article Dr. Howard makes the following interesting observation: "When we consider that the house fly may carry thirty distinct diseases and parasitic organisms, and that its occurrence in great numbers is due entirely to man and his actions, can we fail to marvel at man's utter and even criminal stupidity? The house fly is a domestic animal; its English name is appropriate; and the Latin name, *Musca domestica*, which Linnaeus gave it in 1758, conveys the right idea in this respect, for the species could barely exist away from what is called civilization. If Linnaeus, with prophetic vision of later discoveries, had named it *musca hor-*

rida, or *mortifera*, or *perniciosa*, or *funesta*, or *damnosa*, perhaps humanity would have begun to fight flies at an earlier date."

It seems to be a fairly well established fact now, for the South at least, that the house fly survives the winter in the larval or pupal stage. So it is easy to realize anew the importance of keeping clean premises through the winter months and especially to have all possible breeding places such as stables scrupulously cleaned before the disappearance of frost, that is before the last of March. The problem for cities is to thoroughly police every nook and corner and keep all premises clean. One neglected stable is sufficient breeding place for enough flies to overrun an entire town for a summer, even though every other part of the municipality is clean. Also every dwelling house, large and small, should be carefully screened, the windows with solid screens extending over all window space, and the doors having strong springs in order to keep them automatically closed. For the country the problem is the same but the solution different. Different because a farm family has no appeal to a police power requiring his more careless neighbor to keep his premises free from a fly-breeding menace. It is recognized now through experiments carefully made, that contrary to general belief, house flies may migrate several miles. So, it is more apparent than ever that the house-fly problem is a community problem. No city, town or rural community, civically speaking is any cleaner than the dirtiest residence lot or farm in it. The same principle from a health standpoint as the chain and the weak link. The farmer can, and should, have his own house just as carefully screened as the city dweller and should of course keep all stables and barns clean in order to destroy the breeding places of flies. Cleaning and screening with inside swatting is the only treatment worth while prescribing for the fly danger. As usual prevention is much more important, and abolishing all breeding places is the only course to advise.

There is no doubt, but that the

substitution of the family flivver and its back-yard garage for "old Dobbin" and his ill-kept stable; and the success of the commercial dairy enterprises has tended for the past year

or two to greatly diminish the danger in some cities. But there are plenty of breeding foci left in all such towns to require constant vigilance on the part of every citizen.

MEDICAL HISTORY

(Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.)

SMALLPOX

When we hear a subject mentioned that we have heard discussed all our lives, like the weather, hard times, or high prices, and nothing much ever done about it, we naturally prefer to change the conversation and talk about the new school board, or the next candidate for governor, or something else in which something is always being done about it. However, the subject of smallpox, although one we have always heard discussed, is a subject that will continue to be a problem until preventive vaccination is made universal in all lands. Recently a judge of the Superior Court contracted a case of smallpox while holding court in one of the largest cities in North Carolina. Still more recently, a woman 27 years old and the mother of three children, died in Eastern North Carolina. She had refused to be vaccinated or to allow either of her children to be so protected.

Thus, in the one case the whole machinery of a court costing hundreds of dollars a day, and unnecessary expense to hundreds of people, was disorganized for two weeks; and in the other case three small children are left motherless in order to pay the penalty for somebody's prejudice or carelessness. We like to think that in the case of the judge it was simply carelessness or lack of thoughtfulness in protecting himself, but in the case of the mother it was simply blind prejudice on the part of some fanatic who had poisoned her mind to the extent of costing her life rather than provide herself with the

protection so easily procured through simple vaccination.

Smallpox is one of the oldest diseases in the world. Complete examples of its ravages have been discovered, establishing proof of its existence in epidemic form in Egypt 3,500 years ago. A Syrian epidemic occurring in 302 A. D. has been vaguely described in medical writings of that time. The word "variola" was used to describe the disease by a bishop in the 6th century. It has been estimated that in the century ending with the discovery of vaccination by Jenner about 1798 that it caused the death of 100,000,000 people. Some form of inoculation had been known and practiced for centuries, even in Oriental countries before Jenner placed vaccination through the use of vaccine on a thoroughly sound scientific basis. Gilbert, a great exponent of Anglo-Norman medicine, first mentioned smallpox as a contagious disease in the thirteenth century. While his statement was denied by more or less eminent authorities for two or three hundred years afterward, we now know that it is one of the most contagious diseases in the world. It is caused by an organism so infinitesimal that so far it has been impossible to isolate it. In its confluent form it is a very fatal disease. Where communities have been free from its ravages for several years, or where they have been protected through vaccination and then become careless about vaccination for a period of years, allowing large numbers of chil-

dren to grow up unvaccinated or an influx of people from among an unprotected population, an outbreak is exceedingly serious. The city of Denver, Colorado, had such an experience in 1922. From January to December inclusive 805 people had the disease and 247 of them died. About 30 per cent. That was worse than an epidemic of typhoid fever ever did at its worst. If a majority of sensible people throughout the earth were to listen to the crack-brained fanatics and their propaganda of falsehood for a period of say 25 years, the disease would again become a menace to civilization in all the world.

The preparation of vaccine today is done under U. S. government supervision and the process from start to finish is absolutely clean. There can be no possibility of conveying disease or contamination. As practiced by a majority of physicians and health departments the procedure is as safe as anything can be, and it protects. The North Carolina State Board of Health through its Laboratory of Hygiene prepares and distributes free of charge to physicians and health departments a thoroughly reliable product. One of the best requirements any County Board of Education can make and enforce is that no child can enter the public schools of the county or city as the case may be until successfully vaccinated. When this is done before a child is 6 years of age it disturbs the child very little and is soon over, and the child is protected to some extent for life. Every health officer, whether whole-time or part-time, in North Carolina should be required to vaccinate free of charge any citizen at any time during working hours on office days. He should be required to visit schools and vaccinate the children there at least once a year.

COFFEE

If all of us could be told of our failings repeatedly it is more than probable that most of us would eventually do something about it. It is with such a feeling that we take pleasure in publishing here a particu-

larly pertinent and accurate criticism of one of our most pernicious customs, a custom which licenses every fellow who has ever made a failure of everything else to run a public cafe or restaurant and purvey food to helpless but hungry transients. The South, of course, has no monopoly in making and serving coffee that is unfit for human consumption, but without a doubt we are more guilty than some other sections.

This, from one of Berton Braley's syndicate articles as published in the Raleigh Times, certainly hits the mark:

The Southland

I like the South—a lot of it—though now and then some spot of it Does not exactly thrill me through and through;
And in this Southern latitude I sure am full of gratitude For all the friendly things that people do.
They have a joyous way with them that brightens up your stay with them,
And they're not out to rob you of your chink,
But one unkindly reference I make with all due deference:
I wish that they'd make coffee fit to drink!

It's muddy as their rivers are! I wonder what folks' livers are Who drink this Southern coffee every day:
A spoon will scarcely sink in it, there must be lye and ink in it.
It's strong enough to pull a heavy dray.
By some infernal trickery they fill it full of chickory
And then, as if that were not quite enough,
They stew it for an hour or two, thus giving it the power to Compete with T. N. T. as potent stuff.

Sometimes, by luck that's notable, you find the coffee potable.
A drink that anybody can imbibe;
But mostly it's incredible, a beverage so dreadable

That nothing in the language could describe.

Oh, Southerners, you've treated me superbly, and you've greeted me

With courtesy wherever I have stayed;

I love you most adoringly, but still I cry imploringly,

"I wish you'd learn how coffee should be made!"

There you have it. The question is, why do we do it? Good, properly-prepared, health-promoting coffee is just as easy to make and only costs a trifle more. If only we would demand it. There are perhaps a few homes left in which good coffee is yet prepared and served; but certainly no cafes or quick lunches and but few hotels in these parts. The only remedy we can think of would be to require the mayor and health officer of every city, town, and village in this State at least, where these places are licensed, to drink 16 cups each a day at 10 cents a cup until the amount of each place's license tax is consumed, that is if the first round did not kill these officers who are responsible. In other words, force the officials who are responsible to "take it out in trade." We say guardedly this might help.

No person under 21 years of age should of course drink even good coffee, for up to that time a healthy young person needs nothing of the kind. But after maturity, with the coming of the ordinary responsibilities of life, there is no pleasure like enjoying one or two cups of real coffee each day. For such young people who have reached the ripe age of 21 during the past few years and so have never seen, to say nothing of tasted, a cup of properly prepared coffee, the following simple formula ought to help some:

To Prepare Good Coffee

1. Purchase only the best grade of pure coffee that can be had.

2. Spend at least \$4 in getting a combination coffee pot in which the coffee (solid particles) is held in a sieve near the top of the pot, and in which the boiling water is poured

over the coffee, the top tightly closed and the product after steaming is poured off from bottom. No egg setting is necessary and no "grounds" can escape into the cup.

3. Never boil coffee under any circumstances if it is to be fit to drink. Boiling extracts the tannic acid and thus makes it a most injurious drink as well as destroys the aroma.

4. Never use "over" by adding a portion of fresh coffee to "old" sediment or "grounds."

HEALTH LAWS

Necessary for Protection of Liberty and the Control of License

Necessary, reasonable and just health laws have been enacted by all civilized governments and are always upheld by all the courts from lowest to highest of all such governments. These laws exist solely for the promotion of liberty and the protection of the aggregate rights of the people and to curb and control license which the unscrupulous always purposely confuse with liberty. Health laws are necessary to guarantee freedom of action for each individual up to the line where such freedom would injure one's fellow-man. Beyond that line liberty becomes license and must be controlled for the sake of the welfare of society. Reasonable health laws, humanely enforced are not oppressive; and officers of the law exist solely for the protection of the people. By necessary enforcement of proper laws our liberties are assured; without enforcement of such laws, license would run riot and none of us would have any liberty. Plague and pestilence would spread over the land like a devastating blast from an inferno. These facts should be endlessly and repeatedly emphasized, especially to growing children. Distinction should ever be made between reasonable laws honestly enforced and foolish laws executed by tyrants, petty or otherwise.

In other words, the law itself and the purpose behind the law is not at fault, but weak, selfish human nature is to blame when justice becomes oppressive to any individual.



The

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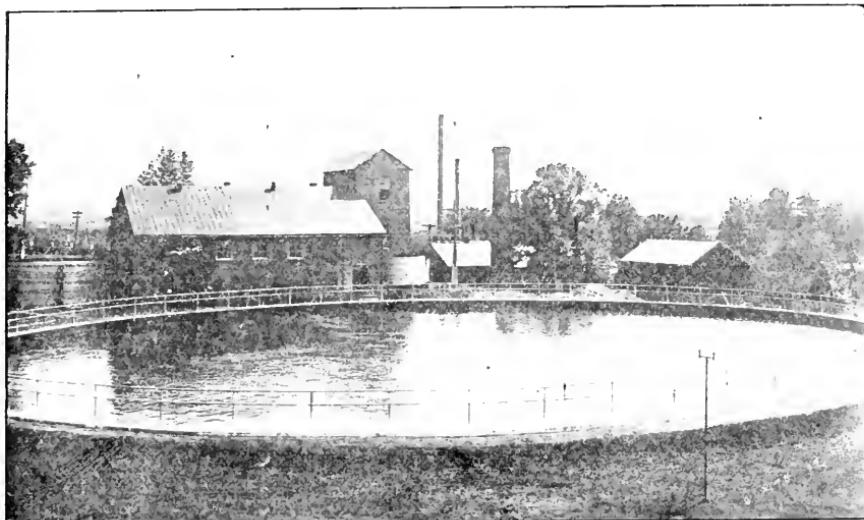
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CAPITAL CITY WATER PLANT

Raleigh, the Capital City, is just completing improvements of its water supply system that will make it among the best of the municipal plants of the State. Shown in the picture above is the pumping station, the filter plant, and the clear water basin. Raleigh, in conjunction with the county of Wake, has an efficient health department under the direction of Dr. A. C. Bulla. The annual budget of the department is \$27,500.

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FREE HEALTH LITERATURE

The State Board of Health has available for distribution without charge special literature on the following subjects. Ask for any that you may be interested in.

WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SPIT PLACARDS	ADENOIDS
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
TUBERCULOSIS	EYES	TYPHOID FEVER
SCARLET FEVER	FLIES	DIPHTHERIA
INFANTILE PARALYSIS	COLDS	PELLAGRA
CARE OF THE BABY	TEETH	CONSTIPATION
FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREAL DISEASES
TUBERCULOSIS PLACARDS	MALARIA	CATARRH

FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The **Health Bulletin** is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for **The Bulletin** each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.

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NEW MEMBERS ON BOARD

To succeed themselves for terms of six years Dr. J. Howell Way, of Waynesville, and Dr. A. J. Crowell, of Charlotte, have been appointed members of the State Board of Health by Governor Morrison. Dr. Way enters upon a fourth term, having begun his service on the Board by appointment of Governor Glenn in 1905. Dr. Crowell was appointed in 1919 by Governor Bickett to fill the unexpired term of Dr. E. C. Register of Charlotte.

The resignation of Mr. Charles E. Waddell, appointed in 1921 to succeed Col. J. L. Ludlow, has been accepted by Governor Morrison and Mr. James P. Stowe, of Charlotte, has been appointed to fill the unexpired term.

At the annual meeting of the Medical Society of the State of North Carolina at Asheville, in April, Dr. Chas. O'H. Laughinghouse, of Greenville, and Dr. Thomas E. Anderson, of Statesville, were elected to succeed themselves on the Board. Dr. Laughinghouse has served since 1911 and Dr. Anderson since 1905.

On account of accepting the position of health officer of Vance County, Dr. F. R. Harris, of Henderson, whose term expired in 1925, resigned from the Board. To fill the unexpired term the Board has elected Dr. D. A. Stanton, of High Point.

At the annual meeting of the Board Dr. Way was re-elected President for a term of six years.

NEW SANATORIUM BOARD

In order to place the State Sanatorium for the Treatment of Tuberculosis on the same basis with regard to management as other State

institutions the recent session of the General Assembly created a Board of Directors for the Sanatorium, to be appointed by the Governor and confirmed by the Senate.

By act of the special session of 1913 the Sanatorium was placed under the management of the State Board of Health, and has been operated by the Board for ten years.

The new Board of Directors is as follows: Dr. T. W. M. Long, of Roanoke Rapids; Dr. J. C. Braswell, of Whitakers; Dr. William P. Holt, of Duke; Mr. W. E. Harrison, of Rockingham; Mr. R. K. Blair, of Charlotte; Mr. John R. Jones, of Sanford; Mr. Jonas Oettinger, of Wilson; Mr. Union L. Spence, of Carthage, and Mr. J. C. Thomas, of Raeford. Organization was effected with the selection of Dr. T. W. M. Long as chairman and Mr. W. E. Harrison as secretary, the Board taking over the administration of the institution March 1st. The superintendent and medical staff of the institution were continued for the present.

DANCING CRAZE DANGEROUS

Like a fire sweeping a field of broom-sedge, fanned by an autumn breeze, a craze for endurance dancing is spreading over the country. From the Gulf to the Great Lakes, and from the Atlantic to the Pacific, men and women are endeavoring to establish new records. The highest yet is 167 hours, but long before this is printed that record will probably be broken in numerous places.

A thing more silly and harmful could hardly be imagined. Such excesses are likely to cause acute dilation of the heart and sudden death.

At best the dancers may expect crippled hearts for the remainder of their lives, while the probable shattering of their nervous systems will make them easy prey to disease.

There will always be some fools ready to do anything for notoriety

or temporary popularity. There is nothing that can be done about it. There is nothing better, or more necessary for health than proper exercise. But long-distance dancing is an inexcusable abuse for which nature demands a heavy price.

TYPHOID FEVER

ONE CAUSE OF DEATH EASILY PREVENTABLE

There are few diseases which are so world-wide in their distribution, so universally known, and so equally feared as typhoid fever. All who have suffered from it, all who have nursed it, and the members of the medical profession are aware that there is little that can be done to modify its course, once the disease is established. Experience has demonstrated that one out of every ten affected with typhoid will die. The other nine who will recover will do so only after long weeks of illness, and even then frequently they do not fully recover, but carry on with them during their remaining years serious physical impairment. Once attacked it is a case of careful dietary nursing, close observation on the part of the attending physician for complication, and chiefly the quality of that unknown quantity, the resistant power of the patient.

THOUSANDS NEEDLESSLY DIE

Typhoid fever in the year 1914 removed from our midst no less than 10,185 people. In 1916 there were 9,510 who died from this cause. In 1918 there were 10,210. In three years as many people as the average county in North Carolina contains were wiped out, an entire county laid waste and desolate economically. But this was only a minor factor. For each one who died there were at least nine others ill with the disease, whose lives were threatened, whose health was impaired, whose families were compelled to suffer because of this disease which is preventable.

Doubtless there are many who will think that this means nothing to the people of North Carolina, because

this State is now free from the ravages of this disease. Unfortunately, that is not yet true. It should be true, but the fact is that last year, 1922, there were 298 deaths from typhoid fever recorded in the State. For the first time the total number had been brought under three hundred, a noteworthy event. Yet these 298 died as needlessly as if they had deliberately taken their own lives.

CAUSE OF TYPHOID FEVER

Typhoid fever, or enteric fever, is an intestinal disease, caused by a microbe known as "Bacillus typhosus," or more commonly as the typhoid bacillus. Through the multiplication of this germ within the body, with the consequent production of a poisonous substance which, for want of a better understanding, may be termed typhotoxin, morbid conditions are produced in various parts which give rise to the characteristic symptoms of the disease. Ulceration of the intestines and enlargements of some of the glands and the spleen are the most pronounced of these lesions. But the bacilli, transported by the blood, often invade other organs of the body, the kidneys, the liver, the lungs, and the bone-marrow. The length of illness is usually six weeks. Experience has shown that one of each ten cases is fatal.

What causes typhoid fever? Where does it come from? How can it be prevented? These are natural questions for which modern science has discovered answers.

The typhoid bacillus, or the germ which causes the disease, was discovered in 1880 by Eberth. It has

been known to science less than half a century, yet in that time it has been the subject of research by hundreds of investigators working in many lands with the result that we now have sufficient knowledge to combat the effects of this germ.

THE GERM ENTERS THROUGH MOUTH

The typhoid bacillus is a minute vegetable cell, cylindrical in shape, with rounded ends. It is so tiny that it can only be seen under a powerful microscope. It enters the body through the mouth and passes through the stomach into the intestines. Here the bacilli find conditions favorable to growth, especially in the lower third of the small intestines, where the inflammation and ulceration are most conspicuous. There they force their way through the enfeebled membranes, enter the lymph and blood channels, and are swept on through them to the spleen and other parts of the body.

During their growth the typhoid bacilli are active in producing a specific toxin which is liberated in the blood. It is the reaction of the body against this which, in great measure, is responsible for the well-known symptoms of the disease. Depressing the powers of vital resistance, various organs become affected, and bronchitis or pneumonia may become established, the heart action may be weakened, and the nervous system deranged. Typhoid fever is, therefore, a disease which operates partly by the direct influence of the bacteria, and partly by the indirect influence of the poison which they produce.

HOW THE GERMS ARE SPREAD

It has been firmly established that the typhoid bacilli are present in the body of every person affected with the disease. It has been pointed out that the mode of entry into the body is through the mouth. It is now pertinent to inquire how they leave the body, in what numbers, in what conditions, how long they persist, and how they are conveyed to other persons, so as to spread the disease.

Since typhoid is very largely a disease of the intestines, obviously the

bacilli ought to be found in the discharges of the bowels. Careful studies have shown that they are so found. They are especially abundant during the earlier stages of the disease, but decrease as the patient convalesces. As to the number, no accurate figures are available, but the number for a single evacuation of the bowels may easily exceed a billion. It is certain that the bacilli leave the body in a living and virulent condition. How long they persist in the bowel discharges is not certain, the period varying with different patients. It is safe to observe the greatest care in the disposition of the bowel discharges for at least two weeks after the patient is well. In the "typhoid carrier" the feces may be infected for months, and even for years.

While the bacilli are principally to be found in the bowel discharges, their presence in the kidneys and bladders of many patients naturally causes the urine to become infected. In some cases the bacilli are found in the mouth and throat, so that the saliva may contain them. This condition is infrequent, but is always liable to occur. The sensible plan, and the only safe one, is to carefully dispose of the urine as well as the bowel discharges, and to provide the patient with special handkerchiefs or cloths to cover any cough or sneeze. The sputum of the patient is also a possible source of infection, especially in those cases where pneumonic symptoms are prominent.

EACH CASE SOURCE OF INFECTION

Every case of typhoid fever is a possible source of infection to others, and must be so regarded. Fingers, food, and flies are the chief means of spreading the disease. It is impossible for one nursing a typhoid patient to avoid finger infection, and unless scrupulous care is exercised the germs may be widely distributed about the house, to other members of the household, and so on to outsiders. In the same manner the bed linen, towels and clothing of the patient, and the eating utensils should be most carefully disinfected. The

careless disposal of the body wastes of the patient, however, affords the readiest source from which the disease may spread, and flies are the busiest agents in the transmission of the disease.

There is just one way, and one way only, in which typhoid fever may develop. That way is by swallowing the germs. To state it baldly, only the eating of filth will cause the disease. It is for this reason that food, water, milk, or dirty hands comprise the usual sources of infection. Flies alternately feed upon the exposed bodily wastes of the typhoid patients and food that is eaten by others. The typhoid germs are carried literally by the million on the hairy legs of the flies, and are left wherever they settle.

Frequently the slops from the sick room are carelessly thrown out. Perhaps a vegetable garden is near-by from which is gathered radishes, lettuce, tomatoes, celery and other vegetables that are eaten uncooked. A rain washes some of the excreta into the garden plot, chickens further aid in the spread. The vegetables are gathered and carefully washed, of course, but the contamination remains. The food is eaten and in about fourteen days there are other cases of typhoid.

HOW WATER IS POLLUTED

Or perhaps the waste matter is so thrown out that subsequent rains will cause drainage into shallow wells or springs. The water becomes heavily charged with the typhoid bacilli. Again there are other cases caused, even sometimes an epidemic. In a mill village of the State a citizen developed typhoid. About twelve houses were served by a single open well. Members of the family of the sick man came to draw water from the well, as usual. Their dirty hands carried a heavy dosage of typhoid bacilli to the water, and cases developed in every family using water from that well.

What was once the greatest source for infection in North Carolina is now happily fast disappearing. This is the insanitary, open-back privy, literally a curse of the State. A lot of people felt that when the wastes

from the sick had been poured into the privy all ordinary care had been taken. As a matter of fact, in all too many instances no care whatsoever had been exercised. From the open back the filth was spread by flies, by chickens, by domestic animals. Under the State laws every residence within three hundred yards of another in any city, town, or village is now required to have installed either water sewerage or a sanitary privy, which, in construction and maintenance, is approved by the State Board of Health.

CLEANLINESS BEST PREVENTION

There are two ways of preventing typhoid. The first, and the most important one, is through cleanliness. This applies to the individual and to the community alike. Keeping the hands clean, the food clean, the premises clean, is the first line of defense. In any community, however, it is unfortunately true that there are some people who will not be clean either in their person or their homes. These are a menace to their neighbors. Against this danger is the second means of prevention, vaccination.

Ten or fifteen years ago it would have been necessary to argue for the use of this means of safeguarding health and life. It is not necessary to do that now. Since 1914, in all sections of the State, anti-typhoid campaigns have been conducted every year, and in that time more than one million people in North Carolina have been immunized.

VACCINATION SIMPLE AND SURE

The process is simple and without danger. Typhoid vaccine is administered in three doses at intervals of one week. There is usually a slight reaction. The treatment confers immunity against typhoid for a period of at least three years, perhaps longer. Experience has proved the truth of this, and there is no longer argument as to the safety and value of taking this precaution. The protection is positive. Yet ignorance and prejudice to some extent persist, and a large number of people refuse to protect themselves. Some time

ago thirteen cases developed in one family in Richmond County. There were twenty-one members of the family. When the first case developed the other members of the family were urged to take the anti-typhoid treatment. They obstinately refused until the thirteenth case had developed. Only then would the remaining eight members of the family, who were still unaffected, consent to be rendered immune.

Typhoid fever is no respecter of age. Death certificates on file with the State Registrar show a number of deaths from this cause in children under five years of age, some even under one year. There are a large number who have died from it beyond fifty years; some even over eighty-five. Neither does it respect the color line, nor social distinctions.

A WINNING FIGHT BEING MADE

It is interesting to note how the fight against typhoid has been consistently a winning one during the past nine years. The following table showing the total number of deaths from this disease year by year, tells a wonderful story:

Year	No. deaths	Death rate
1914	839	35.8
1915	744	31.3
1916	700	29.1
1917	726	30.2
1918	549	22.2
1919	427	17.0
1920	329	12.8
1921	307	11.7
1922	298	10.9

Last year, for the first time, the number of deaths from this cause fell under 300. During the past two years the State Board of Health has records of more than 250,000 people in the State vaccinated against the disease. This has been one of the great factors in the great reduction in deaths.

More important, however, has been the tremendous improvement in sanitary conditions throughout the State. During the past few years there has been a wonderful betterment in public water supplies, in the safer production and handling of milk, and in the proper disposal of sewage. The State law requiring the installation of sanitary privies, wherever water sewerage systems were not available, has probably been the biggest single factor. North Carolina has the distinction of being the only State having such legislation, and it has been very successfully enforced. Vaccination confers immunity for a time, but proper sanitation is the only method of entirely eradicating typhoid.

SUMMER IS TYPHOID SEASON

The summer months constitute the typhoid season. Every year, with the warmth of May, the reports of cases of typhoid begin to increase, rising with the thermometer. The peak is reached in August. There is then a steady decline until the winter months show practically no cases and no deaths. It is significant that the death rate reaches its highest point in the year at the height of the fly season.

Despite all precautions, typhoid will continue to some extent. Some people will always be dirty and careless. Others from ignorance will fail to protect themselves and their neighbors. Intelligent people will make sure of a safe water supply, of careful handling of milk and other food, and of sanitary disposal of all human excreta. They will screen their homes against flies and destroy the breeding places of these conveyors of disease. As a further protection, they will be vaccinated against typhoid as a safeguard from their careless or ignorant neighbors.

PHYSICIAN WANTED

Mr. J. W. Whitehead, Snow Camp, N. C., writes the State Board of Health of the need of a physician in that section, comprising a part of Alamance and Chatham counties. Any physician desiring general practice in good section should write to Mr. Whitehead.

PUBLIC WATER SUPPLY

THE MUTUAL RESPONSIBILITY OF MUNICIPALITY AND STATE

BY

H. E. MILLER, C.E.

Water! Water! It is a cry that has been heard over and over from the beginning of the world, and has resounded through all the ages. The cry has come from the sick-bed, from the battle-field, from the desert, and in frenzied accents it arose even from certain towns of North Carolina during the memorable dry season of 1921.

We must have water at all times and everywhere. Water rushing madly down the mountain-sides is made to turn the mighty wheels of industry. It gives life to the parched and thirsting desert and transforms arid lands into veritable garden spots of the earth. Water is the one universal substance common to all things and essential to all life. It is with respect to the life-sustaining phase of water that this discussion will be confined, particularly as it concerns the preservation of human life.

Water, as an essential of life, is most strikingly illustrated in the ease of the city or the urban community that aspires to become a city. If the city is to prosper, and if the town is to grow and prosper and become a city, the community must have water in great quantities and of known purity. If industry is to be attracted and developed, there must be ample water for manufacturing processes, for fire protection, and, most important of all, there must be a copious supply of pure wholesome drinking water, in order that the labor employed may be strong, healthy, vigorous and efficient. There must also be ample water for flushing and cleansing the streets, for fountains to beautify the parks and for carrying the filth and refuse away from the city through its sewers.

Without water a land is barren, and without water a city is in dire distress. Yet many a city would be

far more fortunate to have no water at all than with the vile filthy fluid called water that courses through its mains and drains from its spigots, because in it lurks the deadly germs of disease that cause the innocent, helpless babies to wither and die, the aged to pass on before their time, and robust men and women to sicken, die, and be lost to the social and economic development of their community. If a city had no water supply at all, its citizens would go to other cities where a safe water supply would probably be found, but if a city's water supply is not pure and wholesome its citizens go on drinking it just the same, probably in ignorance of the danger. Therefore upon the city officials, who have in their charge the care and management of the public water supply, there rests a grave responsibility of greater magnitude than any other care or public trust.

Since the period of election of new, or reinstatement of incumbent, city officials has just passed by for most towns in North Carolina, a heart-to-heart talk with city officials and the citizens whose interests they represent would seem to be most timely and in order.

DUTY OF CITY OFFICIALS

The science and practice of engineering, especially with respect to water supply and sewerage, is exact and highly developed. It is a much more exact science than either medicine or law. It deals with the health and economics of the entire community as a unit, rather than with the individual or the family as a unit. Yet it is not uncommon to find that the same person who would not think of trusting a member of his family requiring an operation to the care of any but the most skilled surgeon is willing to trust the whole community, including his own family

and himself, to the care of an untrained layman, or a jackleg so-called engineer, for the design, construction, and control of the water-works and sewerage system serving the community which he represents and in which he resides.

The city official can hardly be censured, however, for this lack of appreciation of the importance of the fundamental principles involved in the problem in hand. Up to the time of his election he is just one of us, with his attention engaged daily in whatever may be his business, occupation or profession. It behooves all the citizens of the State therefore to give these matters more consideration and become better acquainted and familiarized with the fundamental underlying principles of what constitutes a safe public water supply.

Public water supply, with its problems and its benefits, is the most truly state-wide matter with which we have to deal. It is not confined by the boundaries of city or county. One stream in North Carolina serves as the common sewage outlet and source of water supply for five principal towns within a length of flow of about 150 miles. Every town attracts people to its confines for the transaction of business. These people have the right to protection, but have no voice in the city government. No city can build a wall around itself like China. Even China has opened wide its gates. Therefore, the water supply of the individual town must have both the control and the protection of the State.

STATE-WIDE LAWS CONTROL

The great State of North Carolina was one of the first to recognize this fact and make State-wide laws for the control and protection of public water supplies. The State Board of Health is the State agency charged with the execution of these laws. Certain duties and obligations are thereby placed upon the State Board of Health as well as upon the governing bodies of the cities and towns. It is the purpose of this discussion to cite the principal duties of each body, in order that the respective ob-

ligations may be more clearly understood and greater unity of purpose, with closer co-operation, thereby be achieved. A knowledge of the provisions of the water supply laws is essential, however, in discussing this subject, and since it is found that the citizens of the State in general, and many of the city officials, especially the newly elected officers, are not familiar with the State water supply laws, the three principal sections are quoted as follows:

"7116. Persons supplying water to protect its purity. In the interest of the public health, every person, company, or municipal corporation or agency thereof selling water to the public for drinking and household purposes shall take every reasonable precaution to protect from contamination and assure the healthfulness of such water, and any provisions in any chapters heretofore granted to such persons, companies, or municipal corporations in conflict with the provisions of this article are hereby repealed."

"7117. Board of health to control and examine waters; rules; penalties. The State Board of Health shall have the general oversight and care of all inland waters, and shall, from time to time, as it may deem advisable, cause examinations of said waters and their sources and surroundings to be made for the purpose of ascertaining whether the same are adapted for use as water supplies for drinking and other domestic purposes, or are in a condition likely to impair the interests of the public or of persons lawfully using the same, or to imperil the public health. For the purpose aforesaid, it may employ such expert assistants as may be necessary. The said board shall make such reasonable rules and regulations as in its judgment may be necessary to prevent contamination and to secure other purifications as may be required to safeguard the public health. Any individual, firm, corporation or municipality, or person responsible for the management of water supply, failing to comply with said rules and regulations shall be guilty of a misdemeanor, and upon conviction shall be fined or im-

prisoned, or both, at the discretion of the court."

"7118. Systems of water supply and sewerage; plans submitted; penalties. The State Board of Health shall from time to time consult with and advise the boards of all State institutions, the authorities of cities and towns, corporations, or firms already having or intending to introduce systems of water supply, drainage, or sewerage, as to the most appropriate source of supply, the best practical method of assuring the purity thereof, or of disposing of their drainage or sewage, having regard to the present and prospective needs and interests of other cities, towns, corporations, and firms which may be affected thereby. All such boards of directors, authorities, corporations, and firms are hereby required to give notice to said board of their intentions in the premises, and to submit for its advice outlines of their proposed plans or schemes in relation to water supplies and disposal of sewage, and no contract shall be entered into by any State institution or town for the introduction of a system of water supply or sewage disposal until said advice shall have been received, considered, and approved by the said board. For the purpose of carrying out the general provisions of this and the preceding sections, every municipal or private corporation, company, or individual supplying or authorized to supply water for drinking or other domestic purposes to the public shall file with the secretary of the State Board of Health, within ninety days after the receipt of notice from said secretary, certified plans and surveys, in duplicate, pertaining to the source from which the water is derived, the possible source of infections thereof, and the means in use for the purification thereof, in accordance with the directions to be furnished by the said secretary. Failure on the part of any individual, firm, corporation, or municipality to comply with this section shall be a misdemeanor, and upon conviction those responsible therefor shall be fined not less than fifty dollars nor more than one hundred dollars, at the discretion of the court."

The duties of the local governing bodies and the State Board of Health respectively are set forth, briefly, as follows:

DUTIES OF LOCAL GOVERNING BODIES

1. The exercise of the greatest possible care and precaution in the selection of the source, system of purification or methods of protection of the public water supply. The accomplishment of this object practically always requires the services of a competent water-supply engineer. Water-supply engineering is a most truly exact science. Skill in the profession is developed only by long experience.

In the case of a sick person a doctor is called, and if a delicate operation is required, a skilled surgeon only will be tolerated. When a public water-supply problem is to be solved, an engineer should be called, but not a surveyor, a highway engineer or mechanical engineer. In this case a water-supply engineer should be called, and the town should thoroughly investigate to determine the ability of the engineer and the success he has had in handling similar problems.

2. Plans and specifications for proposed public water supply and sewerage systems and improvements or changes to be submitted to the State Board of Health for approval. The laws provide that failure on the part of the officers of the town or city to do this shall be unlawful. There is a double purpose in this requirement:

(a) By making State Board of Health approval of plans for proposed water and sewerage systems and extensions and improvements mandatory, the carrying-out of water supply projects in all parts of the State in accordance with recognized public-health principles is made possible, using the State Board of Health as a co-ordinator, requiring adherence to standard requirements of a State-wide policy.

(b) By means of such a requirement the municipal officers are brought into contact with a common source of information and advice, and such information as the State

Board of Health may possess regarding the experience, success or failure of other towns with similar problems is available for the aid and guidance of the officers of the town or city proposing improvements as outlined in plans submitted.*

3. Effectively conducting systems of purification and carrying out measures for the protection of the water supply. This can only be accomplished by employing water-works superintendents and plant operators who are competent, conscientious, and intelligent, and who have a proper knowledge of the processes entrusted to their care. There have even been cases in which an ignorant negro was entrusted with the care and operation of a purification plant supplying drinking-water to several thousand persons. The same city officials would not have dreamed of such a thing as entrusting the care and operation of the electric-light plant or fire department to this same negro, because of the money loss that might occur; but is it not worthy of consideration that the lives of the citizens of that city are worth more than all the property value of that city, both public and private?

DUTIES OF STATE BOARD OF HEALTH

1. Examine and pass upon plans and specifications submitted for proposed water-supply improvements.

2. Advise with governing bodies of cities and other persons charged with the installation, care, and management of public water supply and sewerage systems.

3. General care and oversight of all inland water. This broad duty embraces—

(a) The provision of engineers specially trained and experienced in water-supply control and protective measures, whose service is available to any town or water company at any time.

(b) Investigations and reports upon existing water supply and sewerage systems, with recommendations.

(c) Special investigations to determine: 1. Source of pollution in water supplies found to be polluted, and the best means for making the

supply safe. 2. The character and extent of probable sources of pollution, and the best means of avoiding actual occurrences of pollution.

(d) Periodical visits to purification plants, advising with and assisting the men charged with the operation and management of public water supplies, in the interest of improved and more efficient operation, thereby increasing the effectiveness of the public-health protection afforded by public water supply.

Few States have water-supply laws antedating our laws of 1911, requiring quarterly inspection of watersheds, the approval of the State Board of Health for all proposed water supply and sewerage improvements, and the general care and oversight of water supplies by the State Board of Health. In all too many instances, however, the public and public officials alike are unfamiliar with the protection the State has provided them through the State Board of Health, and the extent of information and service that is available through the State Board of Health.

KEEPING STEP WITH PROGRESS

Until recent years, the State Board of Health's approval of plans for proposed water supply and sewerage improvements, with quarterly inspection of watersheds, and monthly laboratory examination of samples of water from public water supplies, afforded the citizens of North Carolina protection that seemed adequate, in the light of development of the science of water-supply protection and the intensity of pollution of the waterways. In the past decade, however, the intensity of pollution of the various waterways has greatly increased. Many towns, due to industrial development and the general migration from farm to town, have grown and expanded to such an extent that water supplies from underground sources are no longer adequate, and in some sections of the State underground water supplies for even the smallest towns cannot be secured. The science of water-supply protection has kept pace with the times, and the developments are no less far-reaching or startling than

the radio, telephone, and other spectacular scientific developments.

The problem confronting public officials today, therefore, is an entirely different problem than that of ten or twenty years ago, and it ranks in magnitude of public health and economic importance second to no other public problem facing the city official.

SERVICE IS OFFERED TO ALL

The State Board of Health is fully aware of the magnitude of the problem and is making every possible effort to discharge the obligation placed upon it by the statutes, and to assist the city officials in meeting their obligations in this respect. The community will profit most only when the local government and the State agency co-operate to the utmost. The State Board of Health, therefore, offers its co-operation to any and all communities, and cordially invites the co-operation of the city officials. A very satisfactory

spirit of co-operation on the part of the city officials has been met in the last two years, in most instances. Accordingly, the public water-supply improvement which has been effected is even greater than was anticipated. In many instances, however, there remains much to be done in the way of water-supply improvement before the greatest possible public-health protection is afforded by all of the water supplies in North Carolina.

New city officials are therefore invited to communicate with the State Board of Health relative to their public water supplies. All of the supplies of the State have been investigated, and the department is in position to give recommendations setting forth the principal defects and most urgently needed improvements for every water supply in the State. This department stands ready to serve at any time. It is hoped that the next two years will witness even greater progress than the last two years.

MEDICAL HISTORY

(Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.)

PELLAGRA

According to Garrison, the first written description of pellagra was by Gasper Casal, a Spanish physician, in 1735. His book, however, was not published until 1762. The disease was called by him "rose sickness." In 1771, Frapolli, an Italian physician, published a carefully written description of the disease, in which he designated it by the name "pellagra," by which it has ever since been known. Although first noted in Italy in 1771, within a period of thirteen years the disease had become so widespread and serious in that country that a hospital under royal authority was founded for the study of its nature. Medical opinion then, as since, was divided concerning many phases of the malady. A new era in

the study of the disease followed the publication of an exhaustive paper about 1810 by Marzari, in which he claimed that the cause was due to eating Indian corn. That theory was later ably championed by the great Lombroso. For at least a century following, the medical profession in Europe was divided into "Maize" and "Anti-Maize" groups; many of the latter maintaining that the disease was not a definite one, but, like indigestion, was a manifestation of other diseases. Since 1780, Italy and Roumania, in both of which countries it is endemic, have been considered the disease centers. Previous to the advent of the present century the disease was unknown in North Carolina, and if it had ever

been present was not recognized. The first contribution to medical literature on the subject in North Carolina was made by Dr. Edward J. Wood of Wilmington, and Dr. C. H. Lavinder of the U. S. P. H. S., in two epochal papers presented by them to the annual meeting of the North Carolina State Medical Society at Winston-Salem in 1908. These papers presented the history of the disease and described the results of their joint research work made at Wilmington for several years previous to that time. At the same time Dr. John McCampbell of the Morganton Hospital presented a valuable contribution on Pellagrous Insanity, covering studies he had made during the previous four years.

The North Carolina medical profession and the people of this State owe a great deal to these pioneers in the profession, who, with prophetic vision regarding the seriousness of the appearance of such a disease, had

the patience to exhaust every effort in a scientific study of the question, and the courage to go on record in presenting their conclusions. The debt to Dr. Wood is especially large, because of his persistent and patient studies in the field of diet as a causative factor in this disease.

As a result of his ability to visualize all the conclusions of preceding investigators, as well as to do creative thinking, Dr. Joseph Goldberger of the U. S. P. H. S., through a series of experiments, has placed all considerations of this disease since 1916 on a sounder basis than ever before. As a result of Goldberger's research work, pellagra is now regarded by a majority of medical men the world over as a "deficiency" disease. Whether or not the conclusions of this majority is final we do not know, but we do know that the disease is of dangerous significance to every citizen of North Carolina today.

PELLAGRA

BY

ROY C. MITCHELL, M.D.

Pellagra is a disease of people who eat too much bread, grits, rice, gravy and syrup, and too little milk, lean meat, green vegetables and fresh fruits. It is caused by eating a diet which is not balanced by the proper amount of each of these two kinds of foods, and which needs more of the latter to balance it. The disease is prevented, and is also cured, by drinking enough milk and eating enough lean meat, green vegetables and fresh fruits.

Pellagra has three main symptoms: a skin eruption; a bowel disorder; and an affection of the mind.

The skin eruption is the most characteristic symptom of the disease. It tells the tale when the looseness of the bowels and the weakness and nervousness, which may have come before it, have failed to do so. It begins like a sunburn and may afterwards peel off. It sometimes turns to a dirty brown color and becomes

thickened, rough and scaly, and cracks or peels. An important thing about the eruption is that it comes out at certain places on the body and usually at the same places on both sides of the body. The backs of the hands in grown people and the tops of the feet in children are common places for it to begin. Other places where it often appears are the neck, face, elbows and knees.

In grown people a complaint of loss of strength, with indigestion or nervousness, or both, coming on or made worse in the spring or summer and improving in the fall and winter, with or without the skin eruption, is often met with. A burning or scalding feeling of the mouth, reddened tongue, burning of the hands or feet, and loose bowels, are also often met with, and are enough to justify a suspicion of the disease if the patient is known to be living on a diet of biscuits, corn bread, grits,

gravy, and syrup, with little or no milk or lean meat. There is no use to look for pellagra in a person who is in the habit of drinking a lot of milk and of eating meat.

CAUSE OF PELLAGRA

What is the cause of pellagra? There are three different opinions held by those who have studied the disease. The largest group is made up of those who believe that it is caused by an improper nourishment of the body, or by the improper action of something in the starch and sugar diet when the proteins of milk and lean meat, and the vitamins of green vegetables and fruits, are left out of it. This idea is supported by the fact that the disease is found in people who live on a one-sided diet of bread, grits, rice, gravy, and syrup, and that it improves and often gets well when the diet is balanced by adding milk, lean meat, green vegetables and fruits to it.

A second group believe that the disease is caused by a germ and that it is infectious in nature. The germ has not yet been found. However, it may be found at some future time. The disease of tuberculosis was known and was thought to be infectious for a long time before its germ was found.

A third and more recent group believe that pellagra is caused by poisons which are made by a class of germs that grow in the intestines, but only under special conditions, and that the most favorable special condition is a diet rich in starches and sugars and poor in proteins and vitamins. This is reasonable. Tuberculosis is a germ disease and is infectious in nature. But many people who work in hospitals for tuberculosis never have the disease. The people who have tuberculosis are those who reduce their resistance to disease by poor habits of living. So the germs of tuberculosis grow in the body only under special conditions. Pellagra may be infectious likewise, and especially under the condition created in the intestines by an unbalanced diet. There are specialists now working upon the disease, searching for a germ as its cause.

But the one fact that all who have studied the disease agree upon is that it occurs in people who live mainly upon a carbohydrate diet that is unbalanced because it does not have the proper proteins in it. The disease has been produced in prisoners by feeding them upon a diet of only biscuits, corn bread, grits, rice, gravy and coffee. And it has been cured by adding milk, lean meat, green vegetables and fruits.

Whether the disease is caused by a germ or not, our present knowledge of it makes the diet the most powerful thing that we have for controlling it. By manipulating the diet we can produce the disease or cure it, although future knowledge may show that we are doing it by growing or killing the germs that cause it.

People who drink plenty of milk and eat lean meat, green vegetables and fruits do not have pellagra. And those who have it are benefited by adding these foods to their diet more than by anything else.

The following is an outline of a bill of fare as an example of a diet which will prevent pellagra. To make it suitable for the treatment of a case that has already developed, substitute more milk, lean meat, meat juice, and eggs. This diet is advised by Dr. Joseph Goldberger, surgeon, U. S. P. H. S., whose study of pellagra has done much to make it a disease that can be controlled:

Breakfast.—Sweet milk, daily. Boiled oatmeal with butter or with milk, every other day. Boiled hominy, grits, or mush, with a meat gravy or with milk, every other day. Light bread or biscuit (one-fourth soy-bean meal), with butter, daily.

Dinner.—A meat dish (beef stew, hash, or pot roast, ham or shoulder of pork, boiled or roast fowl, broiled or fried fish, or creamed salmon or codfish cakes, etc.), at least every other day. Macaroni with cheese, once a week. Dried beans (boiled cowpeas with or without a little meat, baked or boiled soy-beans with or without a little meat), two or three times a week. Potatoes (Irish or sweet), four or five times a week. Rice, two or three times a week, on days with the meat stew or the beans. Green vegetables (cabbage, collards,

turnip greens, spinach, snap-beans or okra), three or four times a week. Corn bread (one-fifth soy-bean meal), daily. Buttermilk, daily.

Supper.—Light bread or biscuit (one-fourth soy-bean meal), daily. Butter, daily. Milk (sweet or buttermilk), daily. Stewed fruit (apples, peaches, prunes, apricots), three or four times a week, on days when there is no green vegetable for dinner. Peanut butter, once or twice a week. Syrup, once or twice a week.

PUBLIC-HEALTH ACTIVITIES

Tonsil Clinic in Pamlico County

Pamlico County, under the active leadership of Taylor B. Attmore, one of the really great educators in North Carolina, has, within the past year, through its co-operation with the State Board of Health, operated on, in public clinics, more than three hundred school children. In June, 1922, following the work of Misses Buchan and Hobbs, sent down to the county by the State Board of Health, a tonsil clinic was held at Stonewall, in which one hundred children were successfully operated on. A questionnaire, sent to the parents of these children in January, 1923, brought out the fact that remarkable progress had been made with reference to health, growth, and school work on the part of a large majority of those children. The school and health authorities of Pamlico, as a result of that clinic, were enabled to visualize the splendid results achieved, and insistence was made in every part of the county for the great numbers of children who needed the operation, and who for various reasons had not been treated in the clinic last summer, that another clinic be held, or some provision be made in assisting them to get their children treated. Therefore, the school and health authorities of the county, after procuring some little assistance from the State Board of Health, made arrangements for a clinic, conducted on the original plan, to be held at Bayboro, beginning early in March of this year. In this clinic two hundred children were

operated on during the month of March, which, added to the number operated on in the State clinic last summer, made a total of one out of every six school children in Pamlico County operated on within a year. We are publishing the account of this clinic simply for the reason that they have pointed the way to any other county in North Carolina who wants to do anything for its defective children. Every official of Pamlico, every school teacher, white and colored, the Woman's Club and other organizations contributed to the success of this work. It is an outstanding record of what co-operation and pulling together with a definite object in view can accomplish. There was no larger percentage of defective school children in Pamlico County than there was in any other county in North Carolina; in fact, the percentage of defects among the white children was much lower than a majority of the other counties; but Pamlico is, up to the time of this writing, the first county to take hold of this matter in an effective and businesslike manner. Pamlico is also leading the way for complete eradication of malaria in eastern North Carolina. If the other counties, every one of them, in eastern North Carolina, would put the force and intelligence behind that fight that Pamlico is directing, within a period too early to risk prophecy malaria would be a matter of history in North Carolina. Thus it is easy to see that the tonsil work for its defective children is but a part of the general program of advancement now being carried through in that county. We hope at an early date every other county in North Carolina will begin to handle its public-health problems in a manner as intelligent as Pamlico.

A ROSE OF THE FUTURE

A World War vet was taking his new-born baby out for a ride and was accosted by an elderly lady, who, after admiring the baby, asked: "Another little soldier, eh?"

"No ma'am, another little Red Cross nurse."—Washington Star.

DIRT AND DISEASE—*or*



HEALTH AND HAPPINESS?

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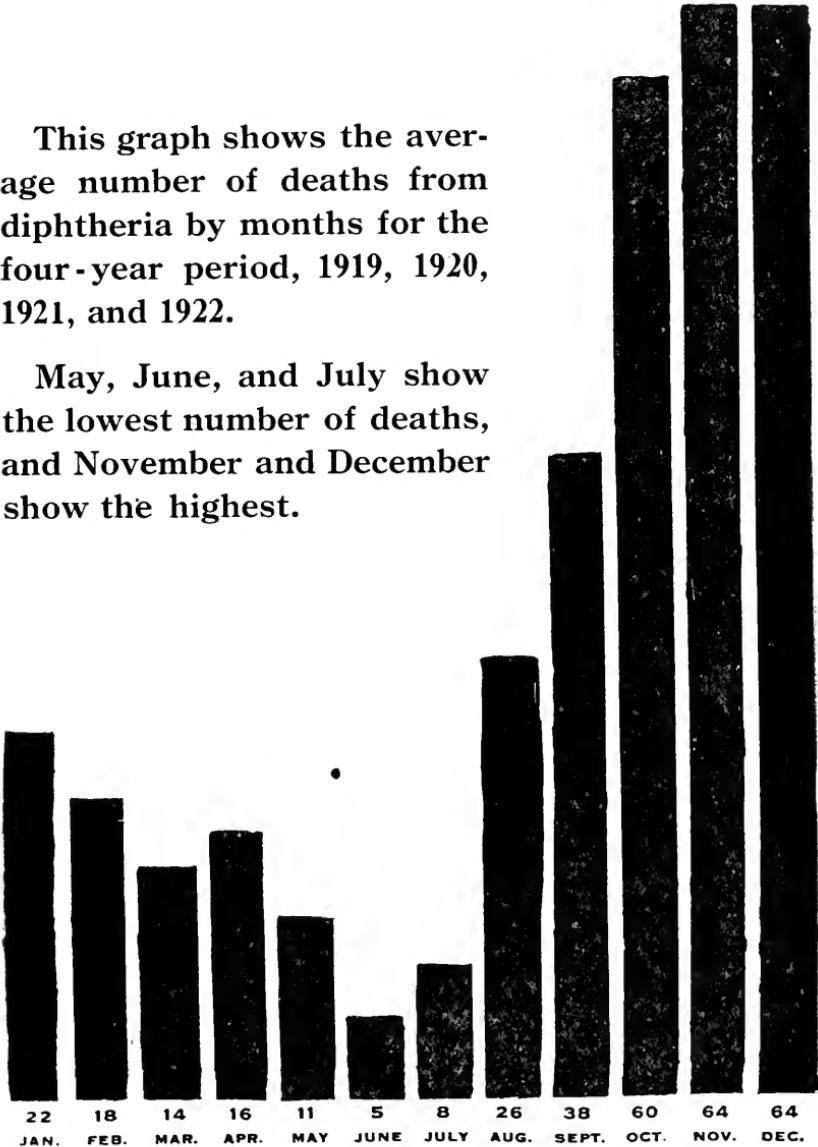
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JULY, 1923

No. 7

This graph shows the average number of deaths from diphtheria by months for the four-year period, 1919, 1920, 1921, and 1922.

May, June, and July show the lowest number of deaths, and November and December show the highest.



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WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SIT PLACARDS	ADENOIDS
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
TUBERCULOSIS	EYES	TYPHOID FEVER
SCARLET FEVER	FLIES	DIPHTHERIA
INFANTILE PARALYSIS	COLDS	PELLAGRA
CARE OF THE BABY	TEETH	CONSTIPATION
FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREL DISEASES
TUBERCULOSIS PLACARDS	MALARIA	CATARRH

FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The Health Bulletin is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for The Bulletin each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.

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DIPHTHERIA

WHY WE ARE FEATURING DIPHTHERIA IN JULY

For the last four years, deaths in North Carolina from diphtheria have been reported in increasing numbers. There were 242 deaths reported in the State in 1919, whereas in 1922 508 deaths occurred in North Carolina. The months of May, June, and July have the lowest rate of any season of the year, but during the last few days of July and on through August reports always come in increasing numbers until the year's highest mortality is reached during the months of September, October, November, and December. Therefore, it is the purpose of the State Board of Health to call attention in this bulletin, which is distributed during the month of July, to the fact that it is the duty of health officers, physicians, parents, and school authorities all over the State to bend every energy toward the prevention of this disease. The United States government statistics are not available yet for any year after 1920, but, judging from the following paragraph in a recent bulletin issued by the New York City Department of Health, this increase must be general throughout the country. The bulletin just referred to states that there were "14,166 cases recognized as diphtheria and reported to the health department last year; of these, 1,045 cases died. What is more discouraging is that there has been no recent improvement." An editorial writer in the June issue of *Hygiea* states that the death rate in the States, in the Great Lakes region, was about

15 per 100,000 population in 1920. The North Carolina rate was considerably under that up to 1920. As stated with reference to New York City, these figures from the Great Lakes region, when compared with our own, indicate, as stated above, that the increased mortality from this disease may be general throughout the country and not peculiar to North Carolina. Diphtheria, like typhoid fever, is a disease in which the cause is definitely known, and, like typhoid fever and smallpox, a disease in which we have almost a specific preventive in toxin antitoxin, which prevents diphtheria fully as well as smallpox vaccination prevents smallpox.

The gravest responsibility in preventing deaths from diphtheria is lodged in the people themselves, and in order to be relieved of this responsibility a physician should be summoned at the earliest possible moment when any suspicion of throat trouble is entertained, and especially if there are any known diphtheria cases existing in the locality. As most diphtheria deaths occur in children, this responsibility is naturally on the shoulders of the parents. When a parent summons a doctor at once, as soon as the doctor enters the household the responsibility passes largely to his shoulders, and his responsibility is entailed in the necessity of making an early diagnosis and administering diphtheria antitoxin in sufficient dosage if he has the least doubt of the nature of

the disease he is called to treat. Both parent and doctor have a responsibility which is shared by school departments and boards of health, especially with reference to children of school age, in that toxin antitoxin, which is a strict preventive and not treatment for the disease itself, should be given to children susceptible to the disease.

In a letter to the editor, received recently, from one of the best known specialists in children's diseases in New York, the writer states, with reference to a discussion bearing on this disease, regarding his own responsibility as a practicing physician, that:

"My own office practice is to see to it that no mother gets into the office and out of it more than two or three times without either the nurse or myself putting up to her the fact that she and her husband must assume a burden that I am not willing to bear, namely, the risk of her child's getting diphtheria unless it is protected against it. I find an al-

most complete ignorance of the existence of any such procedure on the part of many of my most intelligent people; and we then explain just what is available. I find that the nurse can introduce this, perhaps, more easily than I myself; and yet I do not think that this lets me out. I, personally, should feel criminally responsible if a case of diphtheria should occur in a child who had been under my care if I had not at least offered to the parents the protection that I, as a father, have availed myself of in the case of my own children. I am inclined to think that this sense of personal responsibility on the part of the doctors themselves, which they can free themselves of only by insisting that it be shifted to the shoulders of the parents by a careful explanation on the doctor's part, is the only way we can finally get this stuff across."

This is strong language from a very able man, and should be taken to heart by every physician and every parent who reads these lines.

MEDICAL HISTORY

(Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.)

DIPHTHERIA

Sometimes, perhaps in another thousand years or so, the world in general, and medical authors and public-health authorities in particular, will appraise at its true value the great achievements of Moses and the Hebrew race following him, in the field of public health and sanitation. Modern methods of rural sanitation at least, and contagious-disease control, generally speaking, have advanced but little over that practiced by the Jews long before the time of Christ, except those diseases which may be controlled by biological methods. Sanitarians often call attention to the success attained by the Hebrews in such matters as sewage disposal; but the fact is not so generally known that they han-

dled the problem of contagious disease in equally as successful manner.

Most of us think of diphtheria as a disease of modern origin, but it is one of the oldest known diseases. Preuss, quoted by Garrison, says that "Diphtheria, known as *askara* or *serunke*, was so much feared by the Hebrews that the first case located in a community was immediately heralded by a warning blast of the shofar, although the instrument was ordinarily sounded only after the occurrence of the third case of an infectious disease." About the beginning of the second century of the Christian era, Aretaeus, a Greek physician, described the disease which he called "Egyptian Ulcer" (Osler), indicating its ancient Egyp-

tian history, if not origin. Aëtius, a royal physician to Justinian the First, writing near the middle of the sixth century A. D., describes epidemic diphtheria. The disease was called "esquinancie" in the chronicles of St. Denis, 580 A. D. (Garrison). Baronius described Roman epidemics occurring in 856 and 1004 A. D.; and Cedrenus records a Byzantine epidemic of 1039 A. D., in which, according to Hirsch, it was called "cyanche." Hippocrates and Galen, according to Osler, were said to have recognized diphtheria, and Galen was known to have done the operation of laryngotomy. A diphtheria epidemic in 1492 in Nuremberg was described by the city physician. The disease was epidemic in Spain as early as 1581, and by 1618 it had spread to Italy (Garrison). At a very early date, notation was made of the fact that adults were less susceptible to the disease than children. John Fothergill, an English physician and friend of the American colonies, and one of the founders of the Pennsylvania Hospital, in 1748 described diphtheritic sore throat. Huxham, another great English physician, was one of the first to observe in 1757 the paralysis which often accompanies diphtheria. Osler calls an essay on diphtheria by Samuel Bard, of Philadelphia, in 1751, "an American classic of the first rank." Bard described the disease under the name of "angina suffocativa," a significantly tragic name. In 1765 an Edinburgh physician published an article on the cause and cure of "Croup." At that time the disease was known as croup. Not until Dr. John Ware published in a Boston medical journal in 1850 a paper describing a difference between membranous croup and spasmodic croup, had any recognized difference been noted. What Dr. Ware described as membranous croup is what we now know to be laryngeal diphtheria, or one of the most dangerous and fatal types of the disease. A French physician named Bretonneau wrote a monograph on diphtheria in 1826, giving the disease for the first time its present name. Just before this time, on July 1, 1825,

this physician had performed the first successful tracheotomy.

This is extremely interesting history, in view of the fact that the prevention and control of diphtheria in North Carolina in the year 1923 A. D. is one of the biggest problems confronting health officers and the medical profession. To illustrate just how big the problem is, it is only necessary to state that there were almost twice as many deaths from diphtheria as from typhoid fever in the State last year.

The first essential step toward eventual control of this terrible disease in all its long history was made in 1883, when Edwin Klebs, a Prussian pathologist, isolated the bacillus causing the disease; and in 1884, when Loeffler, a Prussian surgeon, established definitely the fact that the disease is caused by this particular bacillus. Hence the germ which causes diphtheria is known as the Klebs-Loeffler bacillus. Following this important discovery, Behring, another Prussian physician, through a series of experiments about 1890 to 1893, succeeded in preparing an antitoxin which was immediately recognized as a specific in the treatment of diphtheria. He did this by demonstrating that the serum of animals immunized against diphtheria toxins can be used as a preventive or treatment against diphtheria in other animals. This discovery, and the principles on which it was based represents one of the great epochs in the history of medicine. But for the pioneer work of Pasteur, the great Frenchman, and one of the founders of bacteriology, these advances in preventive medicine would probably today be still in the future.

The "Schick test," through which susceptibility to the disease is definitely established, and the use of toxin antitoxin as a preventive, represents the last advance of historical importance recorded in the study of diphtheria. Rosenau says that it is a demonstrated fact that 93 per cent of new-born infants have antitoxin in their blood, and therefore are immune to the disease. But at one year of age, only 57 per cent of these children remain immune. He also

says that 50 per cent of children between 5 and 15 years of age are immune. This explains why some children in a family or school equally exposed to the disease will contract it and others will not. Therefore, the problem for parents, school authorities, physicians, and health officials is to find out which children are susceptible and which are immune. This could be done by using the Schick test, but it is now realized that the use of the Schick test is unsatisfactory in general practice outside the hospitals or laboratories of the larger health department organizations. The State Laboratory of Hygiene has discontinued the preparation of this material for the above reasons. As toxin antitoxin is safe, easy to administer, has little or no unfavorable reaction when administered to young children, and is a preventive for life in a majority of cases, it is agreed that the best and simplest procedure is to give the treatment to all children, especially between the ages of six months and six years. In those children possessing the natural immunity no harm is done, and to those susceptible immunity is conferred.

The preparation and use of toxin antitoxin to give immunity to human beings was first attempted by Behring in 1912. He published his re-

sults in 1913; and in 1915 Drs. Park and Zingher, of the Willard Parker Hospital in New York, published a report, giving the result of their experiments that year. Since that time this method of prevention has come into widespread use. The Laboratory of Hygiene of the North Carolina State Board of Health prepares and sends out this material to physicians and health officers at about the cost of mailing. So, any citizen of the State may have, almost for the trouble of asking, the precious immunity that this treatment offers against this terrible disease.

In conclusion, it may be said that diphtheria is one of the few diseases, if not the only one, in which it is possible to determine:

1. Whether or not a person is immune to an attack; and
2. If susceptible, a practically sure preventive in toxin antitoxin is available.
3. If contracted, a specific cure for a majority of cases is at hand (or should be) everywhere in "antitoxin," which, to be effective, must be used EARLY and in large doses.

And yet Five Hundred and Eight People Died from the Disease in North Carolina in 1922. What is the Matter, and Who is to Blame? How Long Shall Such History Continue to be Written?

DIPHTHERIA

ITS PREVENTION, TREATMENT, AND CONTROL

In any consideration of the subject of diphtheria, it is well to call attention in the beginning to the fact that an attack of this dangerous preventable disease, unlike smallpox, measles, scarlet fever, and other contagious diseases in which one attack generally confers immunity against another attack, does not confer immunity. A patient is, after one attack, more susceptible to additional attacks. Very few children under one year old have the disease, and still fewer under six months of age. This is because children are born with a certain amount of immunity

in the nature of natural antitoxin in the blood and tissues. This natural immunity, again, for some unknown reason, seems to be present after maturity—the age of twenty years. A great many people, especially during the winter months, are carriers of diphtheria bacilli, but it is said that only about one out of ten of such people harbor the germs of sufficient virulence to produce an attack of the disease in persons exposed to them. It is now definitely known that only those individuals contract diphtheria who have none of this natural antitoxin, or at least only a minute

amount of it, in their blood and tissues; and until Schick, in 1913, published his description of a simple test for determining this fact, there was no way of differentiating between people who were susceptible to the disease and those who were not. Previous to 1895, or before Behring established the administration of diphtheria antitoxin on a definite therapeutic basis, nothing was known on this subject of susceptibility, or the nature of the existence of antitoxin in the blood and tissues, which prevents the disease occurring in people possessing this agent. Naturally, the mortality from diphtheria up to that time was exceedingly high. The rate in the United States has been said to have been about 150 deaths to each 100,000 population. In North Carolina this rate until 1922 has been under 15 per 100,000 since the admission of the State into the registration area.

CLIMATE AND AGE IN OCCURRENCE OF DIPHTHERIA

Diphtheria is largely a disease of temperate climate; therefore, it occurs anywhere in the State of North Carolina. As in the case of influenza and other scourges, although to a less extent, the disease seems to spread in keeping with the extension of modern transportation facilities. It is possible that the extensive building of good roads and the widespread use of the automobile account to some extent for the increased prevalence of the disease in this State during the last year or two. No age is entirely immune to the disease, but the greater number of deaths occur in children under five years of age. As stated above, the disease is very rare during the early months of life, and is exceedingly rare in people of advanced age. The statistics of the United States Census Bureau indicate that something like 56 per cent of all deaths from diphtheria in the registration area for the year 1919 occurred in children under five years of age. Of the 508 deaths in 1922 occurring from diphtheria in North Carolina, 208 of them were in children less than two years of age, and the great majority

of these occurred in the second year. This indicates beyond any doubt that the control of diphtheria in North Carolina is largely a question of dealing with children of pre-school age, and therefore it is a matter largely for the parent and the family physician.

THE SCHICK TEST

It is natural to suppose that most parents, and the majority of physicians, are averse to the administration of toxin antitoxin, even though it is harmless in its effects, in the case of children who possess natural immunity against the disease. As stated above, the Schick test is designed to differentiate between those who possess the immunity and those who do not. However, great care should be exercised in placing reliance on the Schick test, for three reasons, any one of which may result in a false negative result: (1) The Schick material used by physicians in general practice, having to come through the mails from the laboratory, exposed to all sorts of handling and temperature, and kept in drug stores or physicians' offices until used, may become absolutely inert before being used. (2) The test may be incorrectly used. (3) Until after the physician using the test is thoroughly trained, the conclusions may be erroneous and the reaction seen may be something different from what the physician thinks it to be.

In this connection a special bulletin of the New York City Department of Health states that "It is apparent that the technic of the Schick reaction, although very simple, must be carried out with the greatest accuracy, or the results will be entirely misleading." Therefore, it is clear that the use of the Schick test is of the greatest practical value, provided it be done by physicians who are thoroughly familiar with its use, and who are expert in reading the reaction; but for the majority of physicians the safest plan is not to undertake the Schick test at all, but to insist on using the toxin antitoxin as a preventive in all children under six years of age.

PREVENTION OF DIPHTHERIA THROUGH USE OF TOXIN ANTITOXIN

In these days of moving pictures and rapid transportation facilities, with the resulting promiscuous travel and mixing of the population, it is out of the question to undertake to control a disease like diphtheria by depending on isolation or quarantine of patients having the disease, and persons who have been exposed to it. So it is fortunate that science has developed an almost certain preventive known as toxin antitoxin. This substance is precisely what its name indicates—that is, the actual toxin of the disease which is neutralized by antitoxin. And speaking of the toxin of diphtheria, everybody should understand that this is an actual poison which can be made, and is made, in the laboratories, and that it is exceedingly poisonous until neutralized by the antitoxin; in other words, the toxin of diphtheria is not an imaginary substance at all but a very active and powerful substance. This substance when neutralized with antitoxin, becoming toxin antitoxin, is not dangerous at all, and in nearly all instances when administered to children under ten years of age no unpleasant symptoms follow. The method of administering this preventive is, popularly speaking, "vaccinating" a person three times at about one week apart, following which, after a period of from three to six months, the patient is probably protected against this disease for the rest of life. In New York City thousands of children have been given this treatment, some of them beginning as early as the age of one week, without any untoward results following. It may be given at any season of the year, and certainly all children between six months and six years of age should be given the treatment. There is no sore following, as in the case of smallpox vaccination, and there is very seldom any reaction at all, as is sometimes the case after typhoid vaccination. The worst effect is, sometimes the child will have a sore or painful spot on its arm for a day or two. The laboratory of the

State Board of Health supplies this substance to any physician or health officer in the State for ten cents for the three complete doses necessary for each patient. This just about pays for the mailing of the preparation. If all babies soon after birth were given this preventive treatment, in a very few years diphtheria could be abolished entirely from the State of North Carolina. Again, it may be repeated that the matter rests largely with the parent and the family physician. "When physicians take up the positive side of medicine, and assume the responsibility that is theirs for those who look to them in all things medical, diphtheria will be no more."

HOW DIPHTHERIA IS CONTRACTED

Thus far in the discussion of this disease it will be noted that we have possibly placed the cart before the horse, in that we have gone into the discussion of the prevention of the disease first. The excuse for this is that preventing diphtheria, as well as other preventable diseases, is the chief concern of the State Board of Health.

The cause of diphtheria is a germ. Therefore the disease is caught through personal contact—that is, a susceptible person being exposed directly to a carrier of the disease, or to a person suffering from diphtheria, may contract the disease. It is not air-borne, neither is it contracted, specifically speaking, from one special kind of locality, such as wet, damp places, any more than from any other place, except for the fact that in wet, damp places facilities for the growth and development of disease germs are more favorable. Severe epidemics have been known to occur in which the finding of diphtheria germs in the milk have proved that the milk was acting as the vehicle of transmission for the infection. At least, this is easy to understand, because milk is a favorable vehicle for the cultivation of disease germs, and because of the ease in which this food may be infected on account of the various handling to which it may be subjected before reaching the con-

sumer's table. As in typhoid fever, the employment of a diphtheria carrier in a dairy is exceedingly dangerous. The chief causes which spread the disease, however, are the intimate personal contacts which result from crowds in street cars, moving picture places, schools, and so on. In such instances the coughing and sneezing of a person in the initial stages of the disease cause minute droplets to be thrown several feet forward and so afford direct infection for possibly many people. Eating utensils and drinking cups sometimes afford a vehicle for spreading the disease indirectly. This, however, is not common, and the fact remains that direct personal contact with a carrier, or a sufferer from the disease, is the chief method of its spread. By the term carrier, we mean a person who harbors the bacilli, or germs, of the disease in his body, which do not hurt him, as he is a seemingly well person, but which may mean death through infection to people with whom he may come in contact. The greatest danger of infection from carriers exists in institutions, such as orphanages, or young people's boarding schools, and in infected dairy products, at which time the number of temporary carriers may be greatly increased.

SYMPTOMS OF DIPHTHERIA

Generally speaking, after a susceptible person is directly exposed to the disease a period of incubation elapses which is nearly always short—that is, under one week. By incubation we mean the time which intervenes between the receiving of the infection by the patient and the appearance of the first symptoms. Except in the most virulent cases this is about two to seven days. If the infection is especially virulent, death may result in twenty-four hours, but in cases of nasal diphtheria or laryngeal diphtheria (unfortunately known as membranous croup) the disease may be of long duration. Diphtheria is one of the most treacherous disease in the world. It is a common experience of physicians who have lost patients from the disease of the membranous croup type

to see the patient apparently much better in the daytime for several days in succession only to seem to grow worse suddenly and die. In this type of the disease, which the parent so often thinks of only as croup, and in which much valuable time is lost by messing with home remedies and salves until it is too late to save the child, the patient dies from suffocation often instead of action of the diphtheria poison; in other words, the simple mechanical blocking of the air passages through the windpipe produces death. Many children could be saved even at this stage by prompt intubation by a specialist and the administration of antitoxin. The general symptoms of diphtheria are caused chiefly by the absorption of the poison. The temperature is generally irregular, often not high until late in the course of the disease. Again, there may be severe headache and prostration with high temperature. As a rule the patient, on account of difficulty in breathing and discomfort, is restless and excitable, although the opposite may be the case. Sometimes the poisoning is so severe in virulent attacks that the patient will die before there is any local manifestation of the disease in the throat, but in a majority of instances the local symptoms are present before the symptoms of poison occur marked. The wise physician will discover the condition in the throat and, through the administration of antitoxin promptly, will prevent the occurrence of severe general symptoms.

It is hard to describe the exact appearance of the throat to one who has not seen it, but, briefly speaking, there is a dirty gray, sometimes chamois-skin-appearing membrane, which spreads itself over the tonsils first, rapidly spreading over the larynx and pharynx. A child generally complains of difficulty in swallowing, but this symptom is by no means always present, neither does the child always complain of pain in the throat. The very first symptoms appearing in the throat will be a reddening all over the tonsils and pharynx, after a short while followed by the development of the membrane

unless antitoxin be promptly administered. There may be some swelling perceptible from the outside. One of the most dreaded forms of the disease, of course, is the nasal type, because in this form it tends to become chronic, and because it is so often regarded as merely as ordinary "cold." The disease in this form may escape detection for many days, and even weeks, until the enormous absorption of poison makes it too late for the effective use of antitoxin; death ensuing in spite of all treatment which may be instituted.

COMPLICATIONS IN DIPHTHERIA

Very often a child will have a septic sore throat, or what some doctors term ulcerated tonsilitis, which is not diphtheria, and in which the symptoms are never so severe and recovery is rapid, but in which sometimes it is very hard to differentiate from diphtheria. The careful physician will always obtain swabs in children of this type when he is in any doubt whatever, and, if there is much doubt in his mind, he will administer antitoxin while waiting on a laboratory report. Paralysis frequently complicates the disease, and it is important to know that the paralysis is the result of the poison of the disease. The antitoxin administered as a cure is never responsible for it, as some people sometimes seem to think. In the treatment of the disease previous to 1895 without antitoxin, paralysis was said to be about twenty times as common as it is now. The disease sometimes causes the development of heart disease, which may prove fatal after the child is supposedly well of the actual attack of diphtheria. Broncho-pneumonia is one of the most frequent complications of the disease. Another frequent complication which often follows the active stage of the disease is otitis, or middle ear disease. Empyema and pleurisy are also complications frequently met with. In the severer forms of middle ear disease following diphtheria mastoiditis may result. Sometimes hemorrhage from the nose and ear, and also blood in the urine and stools occur, and most such cases usually end fatally, unless

the patient has been seen in the very early stages of the disease and antitoxin by intravenous injection administered in sufficient doses to rapidly neutralize the toxin in the blood. Nephritis may follow even a milder form of the disease. Sometimes in very young children, especially in the summer months, diarrhoea frequently complicates diphtheria.

THE TREATMENT OF DIPHTHERIA

In the treatment of diphtheria modern medicine has scored one of its most brilliant victories, in the discovery of diphtheria antitoxin. Before the use of this serum became general between one-third and one-half of all the people who contracted the disease died; but last year in North Carolina, even though we had a greater number of deaths from this disease than in several years previous, only one person out of sixteen who had the disease died. This means, technically speaking, that whereas before the people of the State had antitoxin available about 40 to 45 per cent of persons having diphtheria died, whereas in the State last year, 1922, only about 6 per cent of those having it died. The great majority of physicians know that there is only one treatment for diphtheria, and that is the prompt administration of diphtheria antitoxin at the earliest possible moment after the disease is contracted, in sufficient dosage to neutralize the toxins of the disease and to cure the patient without the necessity of a second administration of antitoxin. Just here it is well to state that there is a decided difference of opinion among physicians as to the size of the dose of antitoxin required and as to the necessity for the repetition of a dose. Dr. Louis Fischer, in his excellent work on diseases of infancy and childhood, says that "it has been found experimentally by Dr. Park that if an injection of ten thousand units was given to children a second injection rarely was necessary. The antitoxin was found to reach the blood stream slowly, increasing up to the third, fourth, or fifth day, and then slowly decreasing. That if the

second dose were given twelve hours after the first, the beneficial effects which might be attributed to it were really due to the continued absorption of the first dose, the second only contributing its share. It was also found that when antitoxin was given intravenously a large amount of it went into the blood stream immediately; therefore, this means should be used in desperate cases." The concensus of opinion among active practicing physicians would seem to be today that if a child having diphtheria is seen immediately after the very first symptoms of illness are noted, that if a dose of ten thousand units of antitoxin is immediately administered, that such a dose is sufficient without additional doses of antitoxin. However, the treatment of diphtheria requires careful consideration in every case. There are certain conditions which must always be met, and naturally it is a question which should be left to the individual judgment of the attending physician. The effect of the administration of antitoxin is simply to neutralize the toxins of the disease in the blood. If immediate effects are necessary, the quickest method of producing results is to administer the antitoxin directly into the veins. The second method obtaining the quickest absorption is to administer deeply into the muscles. For obvious reasons this is not satisfactory. The slowest method of absorption is when the antitoxin is administered subcutaneously. In mild or only moderately severe cases, especially when seen early, this is the most satisfactory method of administering antitoxin. In the latter method, which is the one most commonly used by physicians in practice, the needle is simply inserted into the cellular tissues wherever on the body a loose fold of skin may be pinched up; for example, on the thigh, the loose tissues of the abdomen, and preferably on the back, between the shoulder blades, and the antitoxin gradually injected. Fischer says that "there are contributing factors frequently leading to the fatal termination of this disease, and that one of the first and foremost is the presence of the strepto-

coccus in addition to the specific diphtheria bacilli." Whenever we have these mixed cases of infection, antitoxin is inert as regards its effect on the streptococcus and the train of complications which follow in the wake of that infection. Thus it is important for us never to forget that in the treatment of diphtheria, while antitoxin is a specific, yet there are so many complications which frequently accompany the disease that too much reliance must not be placed on antitoxin. Careful restorative treatment must be prescribed for each patient. It is especially necessary to direct careful attention toward the diet of each diphtheria patient. A complete rest in bed is also a necessary requirement. A child especially should be kept quietly in bed until it has entirely recovered. For the comfort of the patient, cleansing throat washes, such as peroxide of hydrogen or boric acid solutions, should be used when a patient is old enough to gargle. For babies it is sometimes necessary to swab the throat once or twice a day with antiseptic solutions by means of absorbent cotton. This is not the place to go into a description of the medical treatment necessary. That is a matter entirely for the physician attending each individual case to attend to.

FUMIGATION AFTER RECOVERY

In the past there have been much time and money lost in fumigating whole houses after patients have had diphtheria and other contagious diseases. Today in North Carolina, except in cities having different regulations, it is necessary when a patient is found to be suffering from diphtheria that a report to the health officer be made immediately and a placard posted on the house or room in which the patient is isolated from every member of the family until the recovery from the disease. The nurse or person who is caring for the child should not mingle with the other members of the household until the patient is recovered. Before the patient is allowed to leave the room in which he has been confined, both patient and nurse should be given a

bath and cleanly laundered clothes from another room be put on, and all washable material in the room should be thoroughly washed and boiled with soap and water. The bedding should be thoroughly sunned and aired; and, to make a long story short, fresh air, sunshine, soap, and hot water is about the best method of fumigating after any disease that has yet been promulgated. The period of quarantine and isolation necessary is a question for the attending physician and the local quarantine officer to decide for each patient.

CONCLUSIONS

To sum up, the most important considerations in the control of diphtheria may be enumerated as follows:

1. The most important thing to do is to get the services of a first-class physician just as soon as possible after the first symptom of "cold," "croup," or "throat trouble" is seen which might lead to the suspicion of diphtheria.

2. The most important thing the physician can do when called to see a sick child is to examine the throat thoroughly, using a tongue depressor and artificial light, and if in the least doubt in the world he should always, under all circumstances, take a swab from the throat and have a laboratory culture made at the earliest possible moment, and while waiting for a report if, as just stated, doubt exists in the mind of the physician, antitoxin should be used.

3. The patient should be isolated from the other members of the family, and the board of health notified just as soon as the diagnosis can possibly be made.

4. The responsibility of every local health department, whether whole-time health officer or part-time physician, whether in the largest city of the State or in the most sparsely populated county, is to see that every child under six years old in the county, whose parents will consent to the procedure, should have the protection of toxin antitoxin.

5. It should be somebody's responsibility throughout the State

wherever antitoxin or toxin antitoxin is held in storage to see that it is always kept at the required temperature as advised by the State Laboratory of Hygiene, in order to insure at all times and under all circumstances the use of a potent product.

6. There can be no excuse on the part of any physician or any parent in North Carolina for not using antitoxin in sufficient doses and at an early stage in the course of attack in diphtheria, because the State has for several years furnished, practically free, for distribution antitoxin of standard quality and in any quantity necessary.

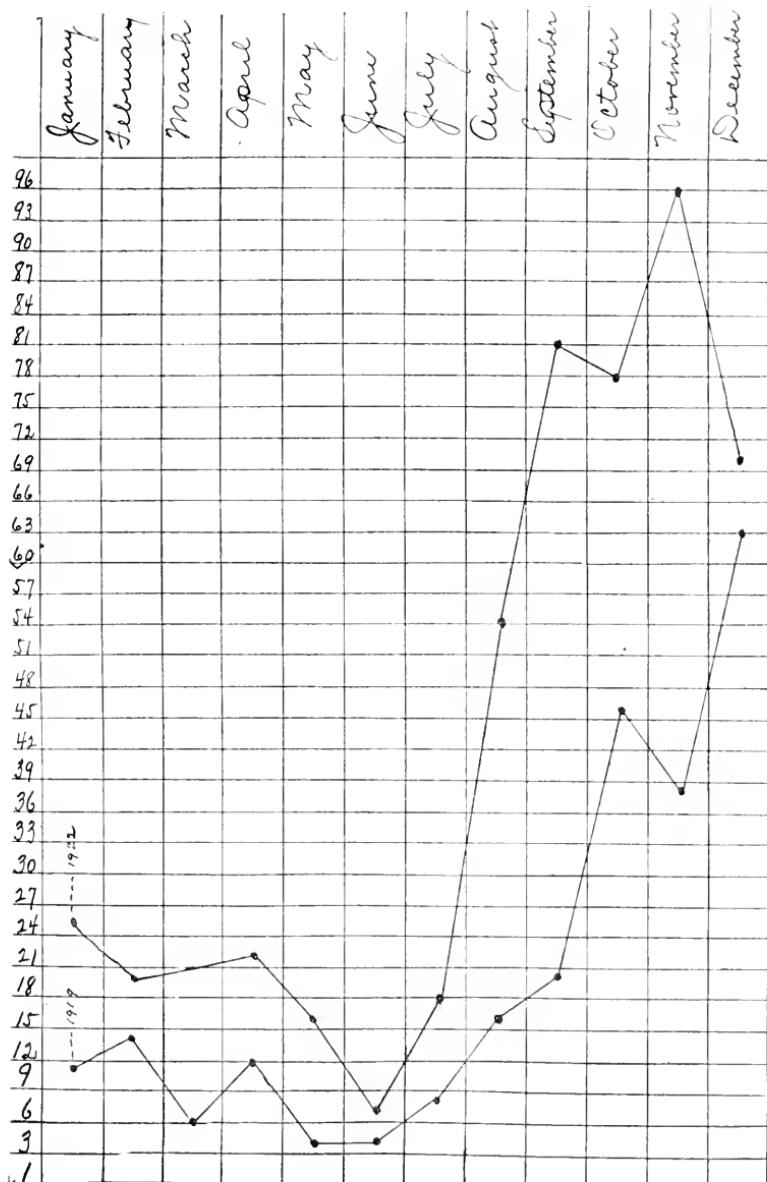
7. Before diphtheria can be controlled there must be the closest public-spirited co-operation between the public, the medical profession and State and local health departments; and education of the public as to the dangers of the disease and the use of preventive measures in its control.

INVESTIGATION OF DIPHTHERIA DEATHS OCCURRING IN 1922

The North Carolina State Board of Health investigated the cause of death in 124 cases of diphtheria occurring in the State in 1922. The names were taken at random and represented deaths occurring in 61 counties, and of the number 98 were white and 26 were colored. The conclusions reached are herewith tabulated together with some of the comments from parents or relatives of the deceased.

Deaths due to failure to call a physician in time	68
Deaths clearly not preventable	31
Deaths due to failure of physician to make early diagnosis	17
Deaths occurring before physician was called	8

Of the parents of the 68 children who died on account of failure to obtain medical attention in time, 36 wrote that they had depended on certain commercial salves advertised and sold as remedies for croup, and 23 of the number had been sick more than 3 days before a physician was called.



The above graph shows the number of deaths from DIPHTHERIA—by months for the years of 1919 and 1922. There were a total of 242 deaths for the year 1919 and DIPHTHERIA deaths increased each year until there were 508 deaths in 1922.

Comments from Parents

"The doctor called it tonsilitis until sixth day; died the sixth day."

The doctor was called after this child had been sick 4 days.

"We thought it was cold and just simple sore throat."

"She took it with a chill or we thought that was it. She did not choke. I will always think that the antitoxin killed her."

This parent thinks antitoxin killed his child and yet he waited more than two days to send for a doctor.

"Child became hoarse on Thursday night. Friday about 10:30 a. m. fever came on. We summoned doctor at 2:30 p. m. He said child had broncho-pneumonia. I used his remedies as he directed until Saturday morning. I saw he was no better, so summoned doctor again at 8:30 a. m. He came back and still said it was broncho-pneumonia, and had me use the mustard plaster. At 1:30 p. m. we called doctor again, and he came and brought another doctor; about 30 minutes afterward baby was dead. The antitoxin was not used until he had quit breathing.

"I never dreamed of baby's having diphtheria until I saw two other children right near us have it, then in about 10 days my little 4-year-old girl took diphtheria. Antitoxin was given her and she was well in a couple of days. Then when I received pamphlets from health officer and read symptoms of laryngeal diphtheria, I knew my baby had died with it."

We publish the above letter for three reasons:

1. To show that although the doctor had failed to make his diagnosis in time, he was unselfish and conscientious and did his best, as clearly indicated by his bringing a fellow physician.

2. To show what an influence for good a wide-awake health officer can exert.

3. To emphasize the importance of getting people to read the literature on preventable disease before, instead of after, the information it imparts is so sorely needed.

"I first thought she had tonsilitis until I had a physician."

"Did all we could for child, thinking it was just sore throat."

"Child was not well for six days, used salve for croup, thinking that was trouble, child was not confined to bed before death."

"My baby died from membranous croup, but did not get antitoxin in time. Had a physician immediately after child was taken sick."

"Doctor said child had tonsilitis and took no culture. Doctored for tonsilitis eight days. On eighth day said he didn't understand child's condition and called a specialist. Gave antitoxin but child lived only a few hours after. Toxin antitoxin was given six or eight weeks before. Was there something wrong with the toxin antitoxin?"

No, the toxin antitoxin was probably all right. It takes from three to six months and sometimes longer for it to confer immunity.

"Thought it was a 'biliary' attack. Wasn't any diphtheria in the neighborhood."

"The doctor said it was spasmodic croup she had. I would like to know a remedy for that croup."

This was undoubtedly laryngeal diphtheria and of course the remedy is diphtheria antitoxin.

The parent of one of the children who died and in which no physician saw the little one writes:

"Doctor never arrived. He was turned back on account of death of child. All kinds of home remedies were used. It was bad liver killed my child."

"I always thought my baby had diphtheria, but doctor said not. No antitoxin was given."

The doctor gave diphtheria as cause of death on death certificate.

"I used everything I could for I did not know what was the matter, and I live so far from a doctor. But I called a doctor Wednesday a. m. but could not get him. So we phoned Dr. —— on Wednesday night and he did not come until Thursday a. m. and the child was dead."

The writer of the above states that the child had been sick six days before an attempt was made to get a

physician. The child lived in a county having a whole-time health officer, but in which there was an epidemic of diphtheria in 1922 which severely taxed the facilities of the health department.

One of the most pathetic letters in the whole group is this from a mother who lost a child within 36 hours after first symptoms appeared and which had the best medical attention, including antitoxin, of course, given within an hour after becoming ill.

"I was so anxious to have all of my children given toxin antitoxin long before she died. I took it up with my family physician and the superintendent of the local school, trying to get it for all the children in the town."

"The Lord giveth and the Lord taketh away" was not spoken of such as these.

The most reassuring fact brought out in this investigation is that of the 124 deaths only 17 of them, or 13 per cent, could be properly charged to failure of the attending physicians to measure up fully to their responsibilities. While so much cannot be said for the parents, when we take into consideration the fact that most of them were ignorant of the true nature of the disease; many of them lived remote from physicians; most of those reporting considered the malady "only cold and croup," and therefore trusted implicitly in remedies advertised for croup, it will be readily seen that few of the deaths could be charged to wilful neglect.

IS THERE NO BALM IN GILEAD?

Jeremiah 8:22 and 9:1

By F. M. REGISTER, M.D.,
Director Bureau Vital Statistics

"Is there no balm in Gilead? Is there no physician there? Why then is not the health of the daughter of my people not recovered? Oh! that my head were waters and mine eyes a fountain of tears that I might weep day and night for the slain of the daughter of my people."

The above text is taken from the writings of the Prophet Jeremiah, and expresses his sorrow for the following after false gods by his people and thereby their destruction. The text is applicable for many people in North Carolina today, in regard to DIPHTHERIA or MEMBRANOUS CROUP. When their children are taken sick with hoarseness and show symptoms of cold and are croupy, they begin to use home remedies or salves and medicines bought from the near-by store, and when the child gets no better and gradually grows worse the doctor is sent for, and he discovers the child has DIPHTHERIA—a deadly disease for which

there is only ONE REMEDY and ONE PREVENTION. The doctor may be in time to cure but often he is too late. Call the doctor early for there is balm in North Carolina for DIPHTHERIA and there are physicians too.

Let us call on the physicians to give the balm, Antitoxin, early for cure and to give the balm of balms, Toxin-antitoxin, for prevention; for prevention is better than all the cures in the world. Then the sons and daughters of our people will escape this dangerous, dreadful, destroying disease which in 1922 carried off 508 of our finest children.

"The little toy dog is covered with dust,

But sturdy and stanch he stands:
And the little toy soldier is red with
rust,

And his musket moulds in his
hands.

Time was when the little toy dog was new,
And the soldier was passing fair,
And that was the time when our Little Boy Blue
Kissed them and put them there.

"Ay, faithful to Little Boy Blue they stand,
Each in the same old place,
Awaiting the touch of a little hand,
The smile of a little face.
And they wonder, as waiting these long years through,
In the dust of that little chair,
What has become of our Little Boy Blue
Since he kissed them and put them there."

8,136 children were reported as having DIPHTHERIA in 1922—causing much anxiety, expense, and many crippled for life.

Just a few years ago a prevention for DIPHTHERIA — TOXIN-ANTITOXIN—was discovered. It has been found satisfactory and is not harmful to the child. It is given to children from the ages of six months to six years. Children over six years are more or less immune to DIPHTHERIA and should be treated by what is called the Schick test to ascertain if they are immune.

Toxin-antitoxin establishes immunity in six weeks to six months after being given. It was most unfortunate that the name of the remedy for DIPHTHERIA, Antitoxin, and the name of the preventive, Toxin-antitoxin, are so near alike as they are often confused.

To recapitulate: DIPHTHERIA is a unique disease in that we have both a specific remedy and a specific preventive. DIPHTHERIA is an insidious disease because often at the onset it is so mild as to be mistaken for slight "cold" and we begin to use home remedies and salves, said to be good for "colds and croup," bought from the nearby store, thereby losing valuable time; just like trying to put out a fire with a squirt gun where buckets and buckets of water are needed and needed quickly.

DIPHTHERIA is a deadly disease because it kills and kills quickly, and

there is ONE REMEDY and this remedy is powerless to cure if used too late and even if used in time and in sufficient quantity and saves the child's life, it is often left crippled for life as the antitoxin was powerless to counteract all the poison of the deadly germs of DIPHTHERIA.

So the question comes down to this: WHY take chances on a cure of this subtle disease, when we have a serum that PREVENTS DIPHTHERIA?

You parents who read this article and who have children under six years of age and do not go at once to your doctor and request him to immunize your child against DIPHTHERIA and your child gets DIPHTHERIA later, are guilty of gross negligence.

Toxin-antitoxin can be obtained from the State Laboratory of Hygiene. SEE YOUR DOCTOR AT ONCE!

"If it were done, when 'tis done,
then 'twere well
It were done quickly."

QUESTIONS AND ANSWERS

We wrote to the father of a child that died from diphtheria last year and asked him how long from the time his child was taken sick before it had been seen by a physician. He replied that it had been 30 hours. We also asked him what home remedies, if any, had been used. He answered: "— salve (naming a well-known product), fried onions, and juice given internally, turpentine and kerosene cloths, ipecac, castor oil, skunk, and raccoon oil, (a commercial product), and many other simple home remedies."

Then the writer proceeded to ask us some very sensible and practical questions as follows:

"What are the symptoms of membranous croup, or so-called diphtheria? Will vaccination for diphtheria prevent membranous croup? How old should a child be before it can be vaccinated? How can diphtheria be contracted? Will cats and other animals carry diphtheria germs?"

While all of these questions are fully discussed in another part of this issue of The Bulletin, it is well to repeat here that membranous croup is diphtheria. It is laryngeal diphtheria, or diphtheria attacking locally the "windpipe;" and is one of the most dangerous, insidious, treacherous and fatal types, especially if there is delay in administering anti-toxin. The symptoms at first are those generally seen in the beginning of a so-called "cold," that is a hoarse, brassy, metallic cough is always present. The symptoms are entirely different from those of pharyngeal or "ordinary" diphtheria. For some time following the first symptoms, which are generally noted at night for the first time by the parent, the child seems to be in fairly good condition, especially the first day following. Soon, however, difficulty in breathing becomes marked, the child will become restless and often clutches at the throat in an effort to get air. There is no membrane seen at first in the throat, therefore making it very hard for a doctor to make an early diagnosis. The most characteristic symptom as a rule seen in these patients, and which is of the greatest aid in assisting a doctor in making an early diagnosis is the rigidity always seen in certain of the "throat"

muscles. These symptoms are followed in a shorter or longer period of time by the general constitutional symptoms of elevation of temperature, headache, prostration, and glandular swelling which may be seen from the outside. A diagnosis is easily made at this stage, but is often too late. "Vaccination" or administration of toxin-antitoxin in three separate doses hypodermically at intervals of one week will prevent membranous croup or any other form of diphtheria in almost 90 per cent of the cases.

The "vaccination" may be commenced at any time after a child is one week old; but the best time is between six months and six years of age.

Diphtheria is only contracted by getting the diphtheria germs into one's system. This is generally done through direct contact with a person having the disease or with a "carrier." Although it may be contracted by getting the germ into the mouth from infected food or drinking cups; or in case of children by exchange of playthings, pencils, or food.

Cats, dogs, and many other animals are susceptible to diphtheria and when having the disease may easily spread the infection to human beings.

UNIVERSAL BREAST FEEDING

HOW EVERY MOTHER CAN NURSE HER BABY

By Frank Howard Richardson, M.D.

Children's Diagnostic and Nutritional Clinic, Black Mountain, N. C.; Regional Consultant in Pediatrics, New York State Department Health; Children's Department, Brooklyn Hospital; Kings County Hospital; Brooklyn Orphan Asylum, etc.

(Dr. Richardson is one of New York's best "Baby specialists;" and in this excellent article he is giving some very practical advice, which vitally concerns the 85,000 mothers and their newly-born babies in North Carolina each year.—Editor.)

There has been no more valuable movement for the reduction of infant mortality and the increasing of child health, than the gradually increasing spread of the gospel of breast-feeding. For a long time it has been common knowledge that the breast-fed baby had several times the chance

for life and health that the bottle-fed baby had. But it is a comparatively recent conception that every baby can be breast-fed, if his mother and his doctor are sufficiently interested in having him get this life-saving boon. For a long time past we have been urging mothers to

nurse their babies, but giving them only the vaguest help toward doing it. Now we are realizing that **every mother can nurse her baby**. Let us be definite about this, and lay down a set of simple rules whereby mother and doctor may be guided.

First of all, she must want to. And if she realizes how much better it is for the baby, and how much easier and surer it is for her, than the tedious, uncertain, cumbrous, time-consuming formula-feeding, she will want to. She will realize, if instructed, that breast-feeding is not a method of keeping the baby well without the doctor's help; but that it is often much more of a tax on the doctor's ingenuity and knowledge to keep the baby on the breast than to write out a formula for it. Therefore, she will take her nursing problem to the doctor when her child is born; and will expect him to keep her baby well by keeping him breast-fed, instead of asking him to get the baby well from one of the scourges that attack the artificially-fed baby—so often, as we know, an impossible task.

Aside from this willingness to put the responsibility up to the doctor, her task will be an easy one. She must get a minimum of nine hours of sleep out of the twenty-four; and she must take a quart of fluid more than she ordinarily would do. The rest of her diet is to be of her own choosing. She may eat, or go without, any article of diet that she fancies or dislikes. If her extra fluid be good, fresh, clean milk, she is doing the best thing possible for the baby. She must put him to one breast every three hours (or every four is better, as soon as he is willing to go that length of time without crying from hunger); and she must let him empty that breast, whether it takes him ten, twenty, thirty, or forty minutes to do so. After he stops for good, she must test the thoroughness of his accomplishment by seeing if she can express any milk from the breast by grasping it between the ball of the thumb and the ball of the first finger, just back of the nipple, and squeezing gently with a slight milking motion. If milk is left in

the breast, this motion will bring it out in drops or jets; and it must be continued until no more milk can be expressed. She must make one more test. This consists in offering the baby, at the end of each feeding (unless she is absolutely sure, by his dropping off to sleep or other signs of perfect contentment, that he is satisfied) a so-called "complementary" or "completing" feeding. The easiest universal formula for this is four ounces of hot water in which have been dissolved four level tablespoonfuls of Dryco. The only way we can tell whether a baby has had enough food is to watch him; no hard-and-fast table can tell us a baby's capacity, but the baby himself is a very safe guide in this particular. The amount of complementary feeding that the baby takes tells us at once how much his mother's milk is short. But it also supplies this deficiency automatically; so that we need not bother with the cumbrous and frequently misleading procedure of before-and-after weighing. In this way we can ease the strain on the nipples that is caused by using both breasts to "fill up" between times.

If this procedure is faithfully carried out, and the baby allowed to take his fill at each feeding (and remember, a little over-flowing of milk from the baby's mouth is nothing to be worried about—even a frank vomiting is not a sign of overfeeding, as can be proved by at once offering him another feeding; the crying that has been put down to "colic" from "indigestion" usually quieting down at once, and the baby dropping off to sleep when satisfied); if this procedure for insuring adequate nursings is faithfully carried out, it will not be long before the mother may cautiously attempt longer waits than the three-hour interval. 6 a. m., 10 a. m., 2 p. m., and 6 p. m. make ideal daytime feeding periods, and can usually be attained to almost from the first week of life, with a consequent saving of the mother's time and strength. By the end of the first, or at any way of the second month, it will usually be found that if the baby is allowed to sleep until he wakes

after this last (6 p. m.) feeding, he will go for six or seven hours, or until around midnight; and if fed then until he is quite content, will go again until the morning (6 a. m.) feeding. In other words, if he is getting all he wants, he will very soon be content with five feedings in the twenty-four hours: that is, three four-hour intervals by day, and two six-hour intervals during the night. This seems so revolutionary a statement that there is only one way in which the doubting mother or doctor can be convinced of its truth; and that is by trying it on the baby. He will welcome it, and prove its truth joyfully.

One thing must be remembered, in applying this regimen. There must be no deeply scientific studying and interpreting of the character of stools. We must force ourselves to remember that the rules we used to apply so wisely as to green stools, curds, watery stools, etc., were to be applied to the napkins of bottle babies, whose food changed only as we altered their formulas. The mother's milk is being constantly altered, not only by changes in her diet from day to day, but also by absolutely mysterious processes minute by minute during the actual feeding time, so that early milk is high in sugar, late milk ("strippings") high in fat, etc. And likewise we must deny ourselves the hitherto-considered inalienable right of dosing with calomel, castor oil, milk of magnesia, etc. These are all absolutely taboo; and are guaranteed to throw the proverbial monkey-wrench into any well-ordered nursing. A reasonably steady gain in weight is a better sign of satisfactory progress than anything the stool ever can show.

Is this all there is to breast-feeding? By no means; but the more difficult points of maintaining breast feeding must be learned by the doctor with as painstaking care as he has been accustomed to bestow upon the never-understood, constantly changing rules for artificial feeding. It would be folly to try to compress the art of breast-feeding into such small compass; but when mothers will do the simple things outlined above, the cases that will seriously

tax the resources of their physicians will be far fewer than those manifold little waifs that are now brought to our doors so frequently, and, alas, so often hopelessly.

DEATHS FROM DIPHTHERIA BY MONTHS

	1919	1920	1921	1922
January.....	11	28	24	25
February.....	14	24	14	20
March.....	6	11	20	21
April.....	12	19	11	22
May.....	4	11	6	16
June.....	4	5	5	7
July.....	8	6	9	18
August.....	16	4	31	54
September.....	20	29	35	81
October.....	46	42	73	78
November.....	38	54	67	96
December.....	63	53	70	70
Total.....	242	286	365	508
Death rate per 100,000.....	9.6	11.1	13.9	18.6

The above table shows the number of deaths from DIPHTHERIA—by months for the years of 1919, 1920, 1921, and 1922. Also shows the total number of deaths from DIPHTHERIA for the years of 1919, 1920, 1921, and 1922, and shows the deaths from DIPHTHERIA per 100,000 population for those years.

CROUP AND DIPHTHERIA

As stated elsewhere in this Bulletin, membranous croup is laryngeal diphtheria, or diphtheria in one of its worst and most treacherous and dangerous forms. Children die in considerable numbers in North Carolina every year on account of some parents, at least, fooling themselves into the belief that "it is only a cold and croup." Every child manifesting symptoms of croup should at once and without delay have an examination by the best physician available, the kind of physician who believes in looking into the throat of a child the first thing when called to see it; and if in any doubt whatever, give a dose of diphtheria antitoxin and takes a "swab" for further examination at a laboratory. Unless these chances are given children, deaths from diphtheria in this State will continue to reach tragic proportions.

COLITIS

As we go to press with this issue of The Bulletin (June 5th) reports are coming from many sections of the State, complaining of the increasing prevalence of colitis. To a physician, health officer, or parent the cry of colitis is worse than the proverbial fire bell at night. It means a long siege at best, delayed growth for the child, days and nights of intense anxiety for the family; and too often, a losing battle. It is a thousand times better to prevent the disease than to try to deal with it after it occurs.

In the May issue of The Bulletin we published an excellent article by Dr. Sidbury, of Wilmington, on "Keeping the Baby Well," in the fervent hope that thousands of parents would read it and abide by the advice given, and so save many lives of helpless little ones this summer. In this issue we are publishing an article entitled "Universal Breast Feeding," by Dr. Richardson, of Brooklyn, N. Y., and which contains a good deal of practical advice in addition to the discussion of breast feeding. Read this article, look up the May issue and get Dr. Sidbury's article; and keep both at hand through the remainder of the summer, is the suggestion we would urge upon all parents of babies under two years of age.

The job of raising a child is the hardest job in the world if properly performed, and the most worthwhile job.

SUMACH TEA FOR DIPHTHERIA

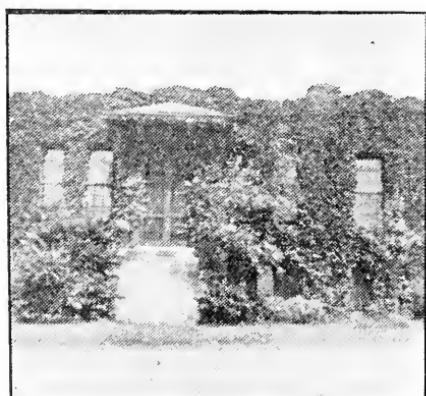
The following paragraphs, taken recently from the Times-Mercury of Hickory, a good North Carolina weekly newspaper, represents about as complete mixture of modern and ancient therapeutic methods as could be devised. It is another item of evidence showing the positive need for education of intelligent leaders, as well as the general public, in things medical. After all the medical profession is partly to blame for "feeding" the public so much mystery in the past, instead of coming out in the open and giving them the plain facts, in simple understandable language, with reference to the nature and cause of such diseases as diphtheria.

"To Prevent Diphtheria"

"The doctors are giving free vaccination against diphtheria, and typhoid. That is, it is free to those treated. And the good parents are taking advantage of it. That is all right.

"It is said those who eat tropical fruit, such especially as oranges, pineapples and grapefruit, won't take diphtheria. It is also said that strong syrup made of big shoemake berry tea and crust sugar, will cure diphtheria. If you can't get a doctor, try it." —

While typhoid vaccine is not an unmixed pleasure, it has great advantages over a case of old-fashioned fever.—Roanoke Rapids Herald.



Front view of the Laboratory of Hygiene, the Laboratory of the N. C. State Board of Health. From this peaceful-looking, vine-clad building, substances to prevent typhoid fever, smallpox, and diphtheria, are sent out daily to all parts of North Carolina. This material is supplied through health officers and physicians, practically free of charge to the people. This great work in disease prevention and relief of suffering is under the direction of Dr. C. A. Shore, one of the most capable bacteriologists in the South.

HOW TO LIVE ONE HUNDRED YEARS



TWENTY-FOUR HOURS IN THE LIFE OF A HEALTHY MAN

GENERAL CARE OF BABIES

SUGGESTIONS TO MOTHERS ON THE CARE OF INFANTS AND YOUNG CHILDREN

In the State of North Carolina, during the year 1922 there were born 81,931 children. Every county, city, town, village and country district in the State is represented in this tabulation of recorded births. Therefore, assuming that, at present, all these children are living, which, of course, is not the case, the most interesting discussion that can possibly take place in these 81,931 homes at this time—in midsummer and therefore a dangerous season for babies—is a discussion of how to keep these 81,931 babies well. We know from our own experience that it is impossible to get too much information of the right sort in the matter of food and care for babies and young children. Therefore, we are here publishing some suggestions that have been published many times before, and distributed to many people, but which are just as important today as ever before. These suggestions are, of course, general and are to apply to the matter of keeping well babies well, but are not to be depended on in case the baby becomes ill. In that case it is a matter of importance for the parent to secure the services of the best doctor available. It cannot be repeated too often that the first and most important right that every baby has on being born is the right of breast feeding. Second, for babies who for any reason are not breast fed, or who have reached the age where the diet must become more general during the summer months, the cow's milk it takes should be boiled for three minutes before giving to the baby. This should especially apply to all children under two years of age. If not absolutely sure of the purity of the water supply, this should apply also to the water given babies during the summer.

For the Nursing Mother

Do not stop nursing the baby before time for him to be weaned,

without medical advice. Eat plenty of nourishing food. Pay no attention to a neighbor who tells you that this or that or the other should not be eaten. Eat what you please. Do not take food or drinks other than water between meals except on the advice of your physician. You should have a regular time for each meal. Some tea or coffee will not hurt, but either should be taken in moderation. An occasional cup of coca or chocolate as a substitute is good. If you drink plenty of water and eat the right sort of food, you will not be likely to have any trouble from constipation. You should sleep nine hours each night. You should take at least one hour's complete rest every afternoon. Avoid patent medicines of any description.

The Bottle-Fed Baby

If the baby is bottle-fed it is important for the mother to know that the milk comes from a reliable source; that it is pure and clean and carefully handled and obtained from a healthy cow. The milk should be placed in the ice box as soon as delivered, or in case of country babies, with fresh milk obtained on the farm, the moment milking is over the baby's milk should be placed in a clean bottle and, if ice is not available, should be kept in cold water and in a cool place. The vessel or bottle in which you keep the baby's milk should be thoroughly cleaned after each using, and boiled or scalded and allowed to cool before each new supply is placed in it. Use separate vessels for mixing the baby's milk, for keeping its supply, and for boiling its bottles and nipples. If an ice box or refrigerator is available, immediately on getting the milk supply each morning a sufficient supply to last for twenty-four hours should be made up. As soon as made up the milk should be poured into individual clean feeding bot-

ties, one to be emptied at a feeding, dividing the supply according to the necessary number of feedings in the twenty-four hours. Each bottle should contain the exact number of ounces for one feeding. The bottles should be covered with the commercial rubber covers, sold for the purpose, or with a piece of clean absorbent cotton. Just preceding each feeding the bottle to be used that time should be placed in warm water sufficient to heat the contents to blood heat, or a little warmer to allow for the loss of heat between the beginning and end of the feeding. Consult a physician who knows how to instruct you in preparing a correct formula for the age of the baby, especially if cow's milk is used to begin with, and if it does not agree with the baby, the physician can tell you how to modify the milk properly; that is, he can tell you the proper proportions of milk, sugar, and water or other ingredients he thinks necessary for the baby to have. To repeat again, boil all milk given during the summer months. Give the baby plenty of cool boiled water to drink between feedings.

Bottles and Nipples

The best bottle obtainable for baby's use is the round bottle accurately graduated in ounces and it is the same size at the top that it is at the bottom. The wide mouth nursing bottle sold at all good drug stores is one of the best. Any good druggist can sell you this bottle with its wide base nipple to fit, together with the rubber covers, and with the cleaning brushes, so after a bottle and nipple are used they may be thoroughly cleaned. Wash thoroughly, using the brush for the purpose, with hot water and soap, rinsing off with hot soda water. The nipple should be kept dry and the bottle kept turned upside down, upon a clean shelf, until using time again. Both bottle and nipple should be carefully boiled before using each time. As soon as the nipple is removed from the boiling water it will immediately dry out and may be kept under a clean glass or in a tightly-covered glass jar.

Some General Diet Suggestions

The average baby requires about one quart of milk each day. This should be continued on through early childhood, at least until the general table diet is more varied. Even more than one quart per day will do no harm, provided enough of other necessary diet is given as the child grows older. After the baby is old enough to begin taking a more varied diet, different kinds of cereals should be given from day to day: for example, oat meal one day, cream of wheat the next, hominy or rice, and so on, for the first few months. While food of this type is given to the baby, it should be boiled for at least two or three hours, and salted to the taste. Most of these foods may be eaten with a little sugar and milk, again taking care, in the summer months, to boil the milk before giving. In the beginning it is well to give only a little each day until the baby is accustomed to swallowing properly, and until its appetite for this kind of food is established. Vegetables thoroughly cooked should be given at the proper age. Different breads may be given in order to add variety to the diet. If white bread is given, it should be toasted. Rye bread or whole wheat bread properly cooked is good. Corn meal muffins made with egg and milk is very good. Any kind of clean commercial crackers, such as Graham crackers and Uneeda biscuit or saltina, may be given. Orange juice strained should be given every day, but may be varied by substituting tomato juice occasionally. A beef juice freshly expressed should be given occasionally. As the baby grows older, this may be placed on rice, which is thoroughly boiled.

A Few Diet Don'ts

Young children between 3 and 6 years of age should not be fed too often between meals. They should not be given, especially those under two years of age, cakes or sweet crackers or heavy, soggy bread of any kind. No greasy indigestible food of any kind should be given to babies or very young children. A baby should never be given coffee,

tea, coca-cola, or any bottled soft drinks. Do not let the baby have a pacifier. Do not scold or frighten the baby. Do not fail to keep the baby's teeth clean and to take it to a good dentist any time after it is two years old if the least indication of dental decay is seen.

Diet List for Children From Six Months to Six Years of Age

The following diet list for the different age groups as indicated is sent out by the State Board of Health to all mothers of young children who are registered with the Division of Maternity and Infant Hygiene. These lists are not intended to replace diet prescribed by any physician for any individual child. The lists are simply intended as a guide to the mothers of well babies and young children, in order to help them keep such children well. It is important that sick babies should be under careful medical supervision at all times.

Age: Six to Nine Months

6 a. m.—Bottle (7 ounces at 6 months; 8 ounces at 7 and 8 months).

8 a. m.—Orange juice (strained), $\frac{1}{2}$ ounce, or strained tomato juice (tomatoes canned or cooked), $\frac{1}{2}$ ounce.

10 a. m.—Bottle (7 ounces at 6 months; 8 ounces at 7 and 8 months).

2 p. m.—Bottle (7 ounces at 6 months; 8 ounces at 7 and 8 months).

6 p. m.—Bottle (7 ounces at 6 months; 8 ounces at 7 and 8 months).

10 p. m.—Bottle (7 ounces at 6 months; 8 ounces at 7 and 8 months).

Milk Mixture: Six Months

Whole milk—24 ounces.

Barley water—12 ounces.

Milk sugar— $3\frac{1}{2}$ level tablespoonfuls.

Milk Mixture: Seven and Eight Months

Whole milk—28.

Barley water—14.

Milk sugar—4 level tablespoonfuls.

BOIL MILK DURING SUMMER

Age: Nine to Twelve Months

6 a. m.—Bottle (8 ounces).

8 a. m.—Orange juice (strained), $\frac{1}{2}$ ounce, or strained tomato juice (tomatoes, cooked or canned), $\frac{1}{2}$ ounce.

10 a. m.—Bottle (8 ounces). Oatmeal gruel (oatmeal cooked 4 hours and strained), 1 tablespoonful.

2 p. m.—Beef juice (freshly expressed), 2 tablespoonfuls (every other day before bottle).

6 p. m.—Same as at 10 a. m.

10 p. m. (or as some baby specialists now advise at midnight or 1 a. m., on account of allowing baby to have long period of rest and sleep in early part of night)—Bottle (8 ounces).

Milk Mixture

Whole milk—1 quart.

Barley water—11 ounces.

Milk sugar— $3\frac{1}{2}$ level tablespoonfuls.

BOIL MILK DURING SUMMER

Age: Twelve to Fifteen Months

6 to 7 a. m.—(1) Milk, 8 ounces; (2) 1 slice stale bread and butter, or Zwieback and butter.

9 a. m.—Juice of an orange strained, or 2 to 3 ounces of tomato juice strained.

10 a. m.—(1) Oatmeal gruel (cooled 3 hours and strained) or Cream of Wheat, Wheatina, Farina, or Pettijohn (thoroughly cooked), 2 tablespoonfuls; (2) Milk, 6 ounces, part of it on cereal; (3) 1 piece crisp, dry toast.

2 p. m.—(1) Beef juice, 1 to 2 ounces, or mutton or chicken broth, 3 to 4 ounces, or half an egg (later an entire egg), or pea soup; (2) 1 piece of crisp, dry toast; (3) Milk, 6 ounces; (4) Strained spinach, or carrots.

6 p. m.—Same as at 10 a. m.

10 p. m.—Milk, 8 ounces.

BOIL MILK DURING SUMMER

Age: Fifteen to Twenty-four Months

6:30 a. m.—(1) Milk, 8 ounces; (2) Slice crisp toast or Zwieback.

8:30 a. m.—Juice of orange, strained, juice of tomato (tomatoes cooked or canned), 2 to 3 ounces.

10 a. m.—(1) Cereal, 2 tablespoonfuls, "good measure" (oatmeal or hominy cooked 3 hours, not strained); (2) Milk, 8 ounces; (3) Crisp toast or Zwieback, 1 or 2 pieces.

2 p. m.—(1) Rare scraped beef, or a soft egg or finely minced chicken or heart of lamb chops; (2) One-half baked Irish potato (old) or boiled rice; (3) 1 tablespoonful of green vegetable (spinach, carrots, string beans, asparagus tips, stewed tomatoes or squash), thoroughly cooked and put through a fine sieve; (4) Crisp toast or dried bread; (5) Stewed prunes, strained, 3 or 4; or one-half baked apple, strained.

6 p. m.—(1) 2 tablespoonfuls of Farina or Cream of Wheat, cooked one hour, served as at 10 a. m.; (2) Milk, 8 ounces.

10 p. m.—Milk, 6 ounces. Omitted at 18 months.

BOIL MILK DURING SUMMER

Diet List: Age Two to Three Years

7 a. m.—(1) Oatmeal, hominy or cracked wheat (cooked 3 hours the day before used), served with milk and sugar or butter and sugar; (2) A soft-boiled or scrambled egg or hashed chicken; (3) Occasionally a crisp dry piece of bacon; (4) Stale bread and butter; (5) Glass of milk.

10 a. m.—Juice of orange.

12 Noon—(1) Strained vegetable soup; (2) Rare beefsteak, rare roast beef, fresh fish; (3) Baked Irish potato or boiled rice; (4) Peas, string beans, squash, carrots, mashed cauliflower, strained stewed tomatoes, creamed celery, spinach, asparagus tips, bread and butter; (5) Dessert: Baked or stewed apple, stewed prunes, custard, junket, plain rice or bread pudding, corn starch or plain vanilla ice cream (twice weekly).

5:30 p. m.—(1) Farina, Cream of Wheat, Wheatina, with milk and teaspoonful of sugar; (2) Glass of milk; (3) Stale bread or toast, buttered.

Diet List: Age Three to Six Years

Breakfast—(1) Cracked wheat, hominy, oatmeal (each cooked 3 hours the day before used), served

with milk and sugar, or butter and sugar, or butter and salt; (2) A soft-boiled egg, omelet, scrambled egg, or hashed chicken; (3) Occasionally a crisp, dry slice of bacon; (4) Bread and butter, eggbread, or biscuit and butter; (5) Glass of milk.

Dinner—(1) Plain soups; (2) Rare roast beef, beefsteak, poultry, fresh fish; (3) Baked Irish potato or boiled rice; (4) Peas, string beans, strained stewed tomatoes, stewed carrots, squash, boiled onions, mashed cauliflower, creamed celery, spinach, asparagus tips; (5) Bread and butter; (6) Dessert: Rice pudding, bread pudding, custard, tapioca pudding, stewed prunes, stewed apples, baked apple, scraped raw apple or pear or orange.

Supper—(1) Farina, Cream of Wheat, Wheatina (cooked 2 hours), 2 to 3 tablespoonfuls, served with milk and sugar or butter and sugar or butter and salt; (2) Zwieback or stale bread and butter; (3) Glass of milk, milk toast; (4) Scrambled eggs (twice weekly); (5) Custard or corn starch (once weekly).

Suggestions on General Hygiene of the Baby

The first general bath given a baby should be deferred for about a week, or until the cord has separated from the body, because of the danger of infection taking place through the umbilical vessels. At first the temperature of the bath should be between 95 and 100 degrees F., and to determine the temperature it is necessary to have a bath thermometer. One having a wooden casing is, of course, preferable. As the child grows older the temperature of the bath may be gradually reduced until it may be as low as 75 degrees F. This is known as a tepid bath and may be continued in both winter and summer. Naturally every infant requires additional sponges to keep its buttocks and genitals clean, especially after each bowel movement, in addition to the regular daily sanitary bath. Care should be observed in the use of soap, as soap, especially an inferior quality, used excessively is often the cause of provoking

eczema in babies, because soap acts as an irritant to the skin. Our old friend, the castile soap, is yet one of the best for the purpose of bathing babies. The main care should be in getting through with the bath in a hurry, thoroughly drying the baby's skin after all particles of soap are thoroughly washed off. Powder should be used very liberally, because the drier the skin is kept the better it will be. No soap should be used at all in case the baby's skin shows a tendency to become red or irritated. In such cases the oatmeal bath is good. The way that is given is to take a sufficient quantity of oatmeal, two or three pounds, place it in a bag made of cheese cloth, put in the infant's bath tub with about half the water to be used for the bath, allowing it to soak for about one-half hour, then adding the other half of the water in order to bring the bath up to the proper temperature. The child should be allowed to remain in such a bath not more than five minutes.

Clothing should depend entirely on the weather and the climate. In other words, the baby should be comfortably dressed. The body should never be over-heated by using an excess of flannels or having the room temperature too hot. This frequently provokes irritation of various kinds as well as being bad in every way for the baby; but the body should be well protected in winter, although the clothing should be loose and comfortable. Light clothing should, of course, be worn in the summer. No tight-fitting bands or clothing should be allowed about the baby. The feet and legs should, of course, be protected at all times, because frequently in the spring and autumn months digestive disturbances that are often serious, as well as other troubles, result from the baby's becoming chilled for lack of protection afforded the lower limbs. Sometimes a supporting abdominal band is necessary in cases of whooping cough. In babies having diarrhoea or constipation or other gastro intestinal disturbances a light supporting abdominal bandage does much good.

The shoes should be flat-bottomed and comfortable.

There should be plenty of fresh air and sunshine; that is, good ventilation in the room used for the nursery for children in the winter months. It is especially necessary for a child to occupy a different room in the daytime from the room slept in at night, so that when the room is ventilated in the morning the windows and doors may be opened and plenty of fresh air allowed to fill the room all day, or until proper ventilation is secured, when the doors and windows may be closed and the temperature returns to the right point, around 65 degrees, never over 70 degrees, when the baby may be brought back. The time to take a baby out doors, in the sunshine and fresh air, must depend entirely on the weather and climate. This should be done as soon as safe, but great care should be taken to see that the baby is properly clothed for each outing in the winter months.

Soiled diapers or clothing should never be washed and dried out in the nursery but should be done somewhere else. The diaper should never be used the second time, after becoming wet, until thoroughly washed out with soap and water and dried. The baby should be put to bed, in his own bed, sleeping alone, at the same time every evening and allowed to go to sleep without rocking. Rocking and walking and jiggling a baby is one of the most pernicious customs that any parent can indulge in. According to most authorities a hair mattress, with a very small hair pillow, is one of the best things for the baby's bed. Cotton or feathers should not be used. Whenever light is necessary in the room at night, it should be very soft and dim. No noise should be allowed around the nursery after the baby is put to bed at night.

Regular habits for feeding and sleeping, if established right in the beginning, will contribute a great deal toward the general happiness and contentment of the baby and the whole family.

HEREDITY

By Dr. WILLIAM NEWBOLD

By heredity we understand the inheritance, that is the transmission, of qualities, characteristics, and possibly diseases from one generation to another.

All living matter, vegetable and animal, is composed of multitudes of minute bodies called cells. In any individual all these cells, although they may differ very greatly from one another according to their location in the body, in size, shape, and function, yet they contain certain structural forms which are identical. Upon these smaller structures inheritance depends. These similarities which exist in the individual also exist in all other individuals of the same species. These smaller bodies are not influenced by any bodily change or change of environment and remain the same from one generation to another in the same species. They constitute the physical basis of heredity.

In this way the characteristics of species are maintained from one generation to another. In any two individuals of the same species or family there may be differences of minor nature, but they both show those peculiarities which places them in the proper classification. As an example, two frogs may differ one from the other in regard to size, nevertheless they are frogs just the same. Human beings may vary as to height, form, physical development, color of the eyes and hair, yet there could be no doubt but that they are human. This is spoken of as race inheritance and what is true in this case is also true in the case of family inheritance, not only in regard to physical similarities, but also to mental and habit characteristics. We all know families in which all members not only look alike, but act alike. In some cases this similarity is so close that it is difficult to distinguish one member from the other by a casual observation. This similarity which

exists not only in one generation, but in many generations of the same family, is not the result of chance only, but is based on a fixed law of heredity. The point which we wish to make clear is that what we are is not the result of mere chance, but is determined by laws and factors over which we have absolutely no control.

Let us now see what can be and is actually transmitted from parent to offspring. In the human race, as has already been stated, heredity determines certain of the characteristics both physical and mental. Let us now go back and consider each one of these points separately and see to what extent heredity can be controlled. First, in regard to the physical make-up. Heredity determines the color of the eyes and hair, general physical appearance, and form. These characteristics cannot be changed or altered by environment. If the child is born with blue eyes nothing we can do can change them to brown. If a girl is a brunette she cannot become a blonde unless she visits a drug store, and then that is only temporary. In order for a child to be strong and well-developed it must have strong and healthy parents. The size of an individual, although it depends in part on heredity, is also influenced by the environment and depends upon the amount of food, the freedom from acquired diseases, and various other factors. In the field of mentality and those things which are closely associated therewith, in other words, the modes and methods of conduct and behavior, heredity plays its most important and absolute part. Not all the feeble-minded and intellectual defectives are the result of heredity. Some children suffer from disease in early childhood or infancy which destroys in part their brain and prevents it from developing. Yet by far the greater number

of cases of idiocy and imbecility are the direct results of defective heredity. That is, the child does not inherit those structures which are necessary for normal intellectual growth. From this same fault arises those abnormalities which later are manifested by lying, stealing, and immoral and degenerate acts. Here again training and environment plays a part, but it is a minor one. We have one more thing to consider, and that is the transmission of disease by heredity. In the true sense of the word this does not occur, although it has been a common and accepted belief, for many generations. Yet science, at last, has proof to the contrary, so absolute that it cannot be contradicted. For instance, it was supposed that tuberculosis could be inherited, yet it has been found that what was supposed to be inherited was in fact an infection early in infancy from parents or people who closely surrounded the infant with the tubercular germ. Even syphilis, which was the last one to be taken from the hereditary class, probably is a result of infection at the time of birth or perhaps even before birth, but then not of an hereditary character. But although the actual disease cannot be transmitted, a general weakness or tendency to contract certain diseases can be and is transmitted, but this disease will never be developed unless the individual is exposed to the infection producing the disease or to other influences which cause it.

These are a few general facts of heredity. They are set down here very briefly and without detail, yet they will suffice for our purpose. Knowing these facts, we must next ask ourselves to what use we can put them. The answer to that question is simple. To have normal and healthy children parents themselves must be normal and healthy. Two people should not marry unless they are perfectly convinced that there are no defective characteristics, either physical or mental, in either family. It sometimes occurs that two who are apparently perfectly normal marry and their children will be physically or mentally defective.

This has often been advanced as an argument against the theory of heredity, but this apparent failure of the law to operate can also be explained on purely scientific lines. An explanation would take too long and we will have to ask you to accept the mere statement as true.

We have said that environment plays a part in the development of the individual. By environment is meant the conditions under which growth takes place and consists of food, shelter, training, and education. It is fortunate that this is true. Were it not we would be deprived of hope, for hope can exist only where the possibility of change exists. Heredity gives us certain possibilities for development both good and bad, and it sets the limits. It rests with us or with our parents and guardians which of these possibilities are developed and which are held in check. By proper care, nourishment, education, and training the good qualities, both physical and mental, may be developed to the highest limits and the evil tendencies checked and controlled.

Environment exerts its influence possibly even in the prenatal period, certainly from the time of birth on. The first care must be its physical growth and development, which is influenced by proper food, shelter, and raiment. Then as the child starts developing its peculiarities of behavior it must be taught to conduct itself in such a way as to conform with the life around it. This control must continue through childhood and adolescence as it is this period in which the character is developed. If discipline is wisely administered during this period many of the defects of heredity can be overcome.

Many people are preaching and believing that "millions are now living that will never die," but even if this be true it does not include all of us, so it is still a matter of vital importance to stay away from the business ends of automobiles, shotguns, contagious diseases, etc.—Asheboro Courier.

KEEPING WELL IN SUMMER

"What one should do to keep well in the summer," says Surgeon General H. S. Cumming, of the U. S. Public Health Service, "depends on what one has been doing during the winter." As winter occupations are infinitely varied it may seem at first blush that this dictum calls for equally varied summer programs. However, most occupations fall into certain groups which call for corresponding vacations.

"For instance, most men and an increasing number of women work hard all winter and take a vacation when summer comes. On the other hand, large groups of men and women (farmers, for instance) work hard all summer and take a vacation, if they ever get one, in the winter, when farm work is slack. Most women work hard in their own homes, and they too have earned a vacation, though their right to it is not always acknowledged. Some men and women appear not to work at all, and would probably be very angry if any one accused them of working. These also need a vacation, but very few of them get a real one.

"A vacation should mean very different things to these different classes. A clerk, for instance, should do something that would make him use his muscles (though not to excess) and an iron-mill worker something that would enable him to rest his. A girl who has been typewriting or packing cigarettes or cooking in somebody else's home should use her vacation in outdoor sports such as playing tennis or something like that. A tired wife and mother should rest by getting away from husband and children, soothing her nerves by chatting with other women, and having a few moments of genuine privacy. A "society" girl who really works about as hard as anybody in the service of the Goddess of Pleasure, and is probably (temporarily, at least) sick of teas and men and other girls, would do well to attend

a summer normal school, where she would at least get a brand new outlook on life, unless she has courage enough to get a job in a factory, where, if she was not too haughty, some "factory girl" might take pity on her and teach her the ropes.

"The usual prescription for a vacation is exercise in the open air. Such advice assumes that exercise in the open is the one important thing that most workers do not get. This is, of course, true in regard to many persons, but it is not true in regard to many others—farmers, street cleaners and chauffeurs, for instance. Anybody who has been spending his or her winter evenings in stuffy rooms studying, playing cards, dancing, or just nodding, should by all means get out into the open air in the summer. A truck driver, on the other hand, might well spend his vacation indoors.

"Exercise, particularly in the open air, is valuable, and, indeed, essential to continued good health. Exercise, however, looks chiefly to physical and ignores mental health; and mental health is now considered to be about as important as physical health.

"Millions of persons, women in particular perhaps, need a 'change' rather than a 'rest.'

"As a matter of fact, nearly every one feels this and unconsciously strives to act upon it. The 'tired business man,' of whom papers say so much, is not so foolish as some persons think when he goes to the theater to listen to a farrago of nonsense, for this is the very antithesis of his daily work. Unfortunately going to the theater is like his business, indoors.

"Clerks or working men or girls who attend baseball games show better judgment, for they get mental stimulus; and, if they applaud the players or denounce the umpire with enough enthusiasm, they get a good deal of physical exercise in the open air. On the other hand the farmer

who works 15 hours a day from early spring to late fall might do worse than spend two winter weeks in the city, fighting off the wily 'confidence' men and attending the movies. And more or less similarly for his wife. They would both get enough mental stimulus to sustain them through the laborious days of next summer.

"The point is to get new ideas for the brain to mull over. All persons, after being tied to one set of ideas (or to no ideas at all) for months will find themselves a lot healthier and happier if they can pick up a totally different set during their vacation. Whether the ideas are wise or foolish, they can get a lot out of them, particularly if they can find friends who are considerate enough to find a contradictory set and to stand up for them. The two will prevent each other from vegetating and keep each other happy (even if furious) till the next vacation. Vegetating is the worst thing in the world for a human being—at any rate for the American species.

"It would be well if all persons would adapt this advice to their own circumstances and would plan vacations for the coming summer that differ radically from their daily occupations. Such vacations probably would not turn out quite as was expected, but that would be half their charm. Some persons might even wish they hadn't tried the plan for a week or so after they got home, but the chances are that the next summer they would try the same or some other 'contrary' plan once more."

HE DID NOT BELIEVE IN VACCINATION

Not long ago a citizen of Connecticut asserted he did not believe in vaccination. He said as much to the health officials when there was smallpox in his town. He gave no reason for his disbelief, but didn't think it would do any good. He wasn't afraid of vaccination, but did not believe in it. He was not a rampant anti campaigning against it—he simply did not believe in it.

He declared that he would not submit to vaccination even though exposed to smallpox. He had never had smallpox and was not afraid of it. As to possible administrative measures by health officials to protect the public health and prevent the spread of the disease, he had no objection so long as such measures affected only the other fellow. But if they affected him, or interfered with his business, in that case he must see his attorney first. He must be sure that all his legal rights are duly respected.

But soon things assumed a different aspect. As time passed and more people were vaccinated, the smallpox situation cleared up. There must be a last case in every outbreak of disease. Even after the smallpox pavilion at the isolation hospital was empty and people thought the outbreak over, there was still another case to come. Late one night the health officer was called to see the man who did not believe in vaccination, and found that he had smallpox!

The next day at the isolation hospital the patient thought it very unkind of a health official to suggest that he might have escaped this plight had he been vaccinated. The smallpox eruption distributed over his entire body from his face to the soles of his feet was a fact that could not be denied. AT ONE TIME HE DID NOT BELIEVE IN VACCINATION, BUT NOW HE BELIEVES IN SMALLPOX.

This is not a story of the past.

It occurred in Connecticut in 1923.

And so those people not immunized by vaccination are susceptible to smallpox.—Connecticut Health Bulletin.

Disease is no respecter of persons nor does it always choose an opportune time. The Duchess of York is suffering from an attack of whooping cough, and that just as she returns from her honeymoon.—Smithfield Herald.

*Facts About Dental Caries

(1) *The commencement of caries, unless there is a defect of the enamel, always consists of the solution of enamel by lactic acid formed from the food.*

(2) *Vigorous exercise of the jaws is necessary for the proper development of the jaws and consequently for the regular arrangement of the teeth.*

(3) *Vigorous mastication and a good flow of normal saliva are essential for the proper cleansing of the teeth, or neutralizations of the acid formed.*

(4) *Illness during the formative period of the teeth may lead to mal-development and predispose to decay.*

(5) *The present universal prevalence is not due to inherited defects, it having developed during the last four or five generations.*

(6) *It is therefore due to change in environment arising during the last few generations. The only changes that have been suggested are changes in the food and the way it is eaten. It is the defective feeding of the mother and young child that causes defective development of the enamel and that this is the main cause of early decay. The principal change in our diet is the gradual elimination of hard fibrous food which by enforcing mastication should produce a good spacious jaw, regular teeth, and leave the teeth clean. The principal defect in our foods is their inability to create a good flow of normal saliva, which acts as a natural cleanser and protector of the teeth.*

(7) *There can be no doubt that mastication has decreased enormously in amount and vigour during the last few generations. This may be inferred from the coarser character of the food of by-gone times or proved by the worn condition of teeth in skulls a hundred or two years old. The force exerted in mastication properly performed with good healthy jaws is about 100 pounds, whereas the force exerted in mastication by a considerable section of the population is extremely small. This has been brought about in the first instance by soft feeding and drinking at meal times, and is intensified by caries, irregularities and inflamed condition of the gums.*

(8) *To prevent dental decay, masticate your food carefully. Do not drink with your meals. Do not eat between meals, especially candy and sweets. Close your meal with fresh fruit, or a crust of bread, not with sweets. Rinse the mouth very thoroughly after eating.*

WHY WORRY ABOUT DIPHTHERIA



PROTECT YOUR CHILDREN AGAINST DIPHTHERIA
BY USING TOXIN-ANTITOXIN—THEN YOUR
WORRIES ARE OVER



The

The Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

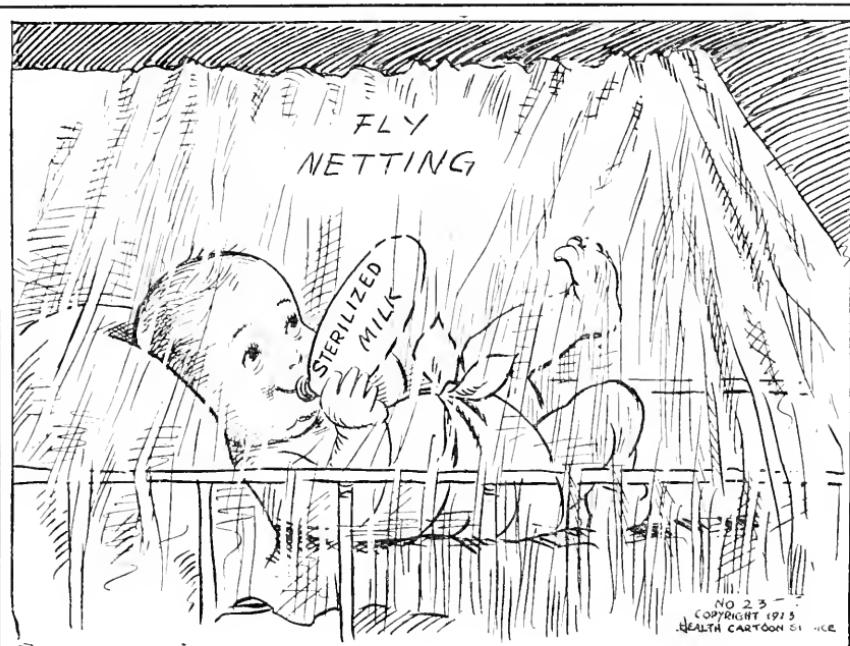
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PROTECT YOUR BABY

If your house is not thoroughly screened to keep out flies and mosquitoes, then the least you can do is to use ordinary mosquito netting over the baby's cradle so that disease-carrying flies and mosquitoes will not endanger the life of your child. During the hot summer months be sure that you boil all the milk given to the baby, and use only wide-mouthed bottles which may be easily cleaned.

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FREE HEALTH LITERATURE

The State Board of Health has available for distribution without charge special literature on the following subjects. Ask for any that you may be interested in.

WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SPIT PLACARDS	ADENOIDS
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
TUBERCULOSIS	EYES	TYPHOID FEVER
SCARLET FEVER	FLIES	DIPHTHERIA
INFANTILE PARALYSIS	COLDS	PELLAGRA
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FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREAL DISEASES
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FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The **Health Bulletin** is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for **The Bulletin** each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.

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MALARIA IN NORTH CAROLINA

During the year 1922 there were 177 deaths from malaria in this State. While this represents a death rate of only 6.6 per hundred thousand population, and these deaths occurred for the most part in a few of our coastal counties, it is a fact that 49 of our 100 counties reported one or more deaths from the disease, and the rate is too high. Beginning about this time (August 1st) and continuing until frost kills the vegetation in October and puts an end to the activities of mosquitoes, there will be more or less suffering from this disease in several of our eastern counties. As malaria is a disease that may be controlled, and is therefore a preventable disease, we are publishing in this issue an interesting report of the intensive efforts at control being made in Pamlico County by Dr. H. A. Taylor. We are also publishing a series of questions and answers on the subject, prepared by Dr. H. R. Carter, of the United States Public Health Service, which gives much valuable information. The work under the direction of Dr. Taylor in Pamlico illustrates conclusively the results which may be expected from intensive efforts toward control. It also emphasizes the fact so well expressed in the language of Dr. Carter in the Public Health Reports, that "The control of malarial fever is a very different problem from its elimination or getting completely rid of it. The methods of work necessary to do this are simple, but to carry them out may well be beyond the economic limit allowable. To control it, however—that is, to lessen its amount that it does little injury in a community—is much oftener possible. It is at last a question of economics."

The control or elimination of malaria is, indeed, a question of economics as well as intelligence. As pointed out by Dr. Taylor, the more intelligent, well-to-do class of the population, who know how to control the disease and are able to provide themselves with safe and comfortable homes, and are therefore to that extent better protected and less exposed, show a much lower incidence to the disease.

There can be no question but that illness from the disease is becoming less each year. As population in the rural districts becomes more dense, and better farming methods prevail, including better drainage of land and better cultivation of crops demanded by modern agriculture, conditions favorable to the breeding and spread of malaria-bearing mosquitoes are gradually removed. The same thing applies to the villages and towns where the people are beginning to require more efficiency on the part of their responsible officials, and where conditions that are a menace to the public health are not tolerated as once they were.

We are publishing in the following table the list of counties in which one or more deaths from malaria occurred in 1922. The table gives the name of the county and total number of deaths, as well as number of white and colored. It will be noted that one death was reported from Madison County, one of our far western counties, in which malaria is unknown among the native population. This death from malaria was due to long-continued residence in a malaria section, and the patient had been carried to Madison in the hope of receiving the benefit of the change of residence to the mountains. It will be noted also that there were a few

deaths reported from the Piedmont section. This was largely due to the fact that during the past two or three years great numbers of negro laborers from all over the worst malarial sections of the South have been imported into North Carolina to work on the extensive highway and other construction-building jobs.

Deaths from Malaria in North Carolina During 1922

County	White	Colored	Total
Alamance	1	--	1
Anson	--	1	1
Beaufort	15	18	33
Bertie	2	1	3
Bladen	1	2	3
Brunswick	1	--	1
Cabarrus	--	1	1
Camden	1	--	1
Carteret	3	--	3
Chatham	--	1	1
Columbus	--	1	1
Craven	7	7	14
Cumberland	2	2	4
Dare	--	1	1
Davie	1	--	1
Duplin	4	--	4
Durham	--	1	1
Edgecombe	2	1	3
Franklin	1	--	1
Granville	--	1	1
Guilford	1	--	1
Halifax	1	13	14
Hertford	1	2	3
Hyde	5	4	9
Iredell	1	--	1
Johnston	1	--	1
Jones	1	3	4
Lenoir	1	3	4
Madison	1	--	1
Martin	--	2	2
Mecklenburg	--	5	5
Nash	1	--	1
New Hanover	1	2	3
Northampton	--	5	5
Onslow	4	--	4
Pamlico	4	2	6
Pasquotank	--	2	2
Pender	--	2	2
Perquimans	--	2	2
Pitt	1	3	4
Robeson	1	--	1
Rowan	--	4	4
Sampson	3	--	3
Tyrrell	2	--	2
Union	1	5	6
Wake	--	2	2

County	White	Colored	Total
Warren	1	--	1
Wayne	--	2	2
Wilson	1	2	3
	<hr/>		
	74	103	177

6.6 per 100,000.

CLEAN THE DRAIN PIPES

For people living in cities and towns this season of the year, when mosquitoes breed in every accessible pool of water about the premises, it is a very necessary thing to see that no breeding places are allowed. All tin cans, barrels, buckets, basins, pans, or vehicles that will hold water should not be allowed to stand with water in them, but should be emptied and drained, and all useless articles of this kind should be sent to the garbage piles. All thick grass and weeds around the corners of the house, and especially near the water faucets, should be pulled up and such areas thoroughly cleaned in order to be allowed to dry. One of the most prolific sources for mosquito breeding places is the valleys on the roofs and the metal drain pipes around the eaves of even the modern houses, which frequently get stopped up from various causes. A frequent source of stoppage of the drain pipes on roofs is the English sparrows which build nests in the pipes and the rains wash them into the drains, stopping them up and allowing the water to remain for several days. All such places afford the finest kind of breeding spots for mosquitoes. The mosquito pest can be reduced to a minimum by attention to all these details by each and every householder.

LACTIC ACID MILK

To the majority of families in this State having babies under two years of age, summer is a season fraught with more or less apprehension on the part of the parents. In nearly every section infantile bowel diseases are more or less prevalent at some time during the hot months. These diseases call for the exertion of every possible resource upon the

part of parent and physician. The mortality is high, and for those who recover, it takes weeks and sometimes months of careful treatment and nursing. Therefore any measure promising to materially aid in preventing, and in treating these diseases, should have the unqualified support of the medical profession and the public. Lactic acid milk, properly prepared and administered, is proving to be one of the most valuable agents in combatting infantile diarrhoeal diseases. So, it is with considerable pride and satisfaction that we are able to publish in this issue of **The Bulletin** two original contributions on the subject. The first, "**Lactic Acid Milk in Infantile Diarrhoea**," by Dr. Aldert Smedes Root, one of the most successful pediatricians in North Carolina, should be invaluable to physicians treating children everywhere, as well as to parents. Dr. Root's experience can be duplicated anywhere, and every baby in North Carolina who needs this aid, in its fight for exist-

ence, should have it. The second article, "**The Preparation of Lactic Acid Milk**," by Mr. Roy S. Dearstyne, now connected with the A. and E. College, is especially valuable as an aid to health departments, city and county, who have not already provided this service, in establishing these stations.

While it is feasible, as fully described by Dr. Root, to prepare this milk in the home, in cities and towns having responsible health departments it is probably more desirable to have the preparation and distribution done through public agencies, especially so, because many homes who need the preparation most would not be able to prepare it.

We are publishing these papers at this time in the hope that such agencies as the Woman's Club in many of the towns will take on themselves the responsibility of inaugurating this program early in 1924. The information presented in these two articles is sufficient for any locality to have to put on the work.

THE INVESTIGATION AND CONTROL OF MALARIA IN PAMLICO COUNTY NORTH CAROLINA

By H. A. TAYLOR, M.D.
State Board of Health

An ever-increasing demand on the State Board of Health by officials, property owners, and others interested in public health work, for a more comprehensive plan for dealing with the malaria situation in the State, led the authorities of the Board during 1921 to consider a means of attack for accomplishing rural control, with the idea in mind of whatever promising leads obtained during the initial work might be made a part of the routine of the average health department of the State.

This led to a careful analysis of the annual death rates for the State from malaria, per 100,000 popula-

tion for the years 1917 to 1921, inclusive. This shows that malaria in North Carolina is largely confined to the eastern section, to that tier of counties about two in breadth bordering the coast and to a much less extent to the adjacent tier. In the western section the disease does not appear to be a serious public health menace.

As the mortality records furnished the only available data relating to the prevalence of malaria to the State Board of Health, and as this was inadequate as a basis for formulating a control program, it was decided to undertake an intensive survey in one of the eastern counties in order to determine:

1. The incidence of the disease and the extent to which it is a menace to the health and economic efficiency of the people.

2. The possibility of controlling the disease at a cost within the economic reach of the average county.

For this purpose a reconnaissance survey was made of a number of the eastern counties, in order that one representing average conditions might be selected in which to conduct intensive studies.

A large part of several of the eastern counties was covered, the topography and economic development being noted. All physicians interviewed were unanimous in their opinion that malaria was on the decline and all druggists reported a decrease in the sales of all anti-malarial remedies as compared with former years.

As a result of this preliminary survey it was concluded that Pamlico County would be representative of all topographic and developmental conditions of the eastern section and that the incidence of malaria there might be regarded as a fair present-day average of that in counties similar in topography.

As a result of the final selection of a county for the initial work, it was decided that an area could be selected within the county that would represent average conditions, and would represent a true average of the malaria incidence in the county.

Accordingly, an area seven and one-half miles long and three miles wide was selected as an intensive area, including the villages of Alliance, Bayboro, Stonewall, Maribell, and Cash Corner. This area includes approximately one-seventh of the total population of the county.

Steps Followed in Conducting Preliminary Survey to Determine Prevalence of the Disease for 1921:

The survey conducted during October and November consisted in preparing a map of the proposed territory, locating each home thereon, with special reference to the breeding of mosquitoes, listing the population, taking a history index as to prevalence of the disease during the year, and taking blood smears for the purpose of establishing a parasitic index.

Survey Map

The map, prepared by the means of a plane table, gave each home its proper location, with respect to public roads, railroads, woods-line, and marshes, which afforded the field observer an opportunity to study the propagation of mosquitoes, with reference to the location of the house. Each home was given a number, in order that the occupants thereof might be observed easily and the incidence of the disease recorded, with reference to the topography of the area.

Population

The population of the area surveyed was 1,485 at the time of the survey, with 749 whites and 736 colored.

History Index

A history index of every individual living in the intensive area was obtained for the year 1921, at the same time the census of the area was established. In preparing the history index, considerable care was exercised to accept as positive histories only those who gave a history of repeated periodicity, corresponding to

History Index Intensive Area, 1921

WHITE				COLORED			
Male	Female	Positive	Negative	Male	Female	Positive	Negative
376	373	373	376	346	390	398	338
Percentage giving positive history 49.79%				54.07%			

the clinical picture of the supposed infection. As a result of this rigid form of history taking, it is believed that the amount of malaria has been under-estimated and that the minimum instead of the maximum is given. House-to-house visits were made for this purpose so that the parents of children might be consulted regarding the taking of the histories, and the interpretation placed on the statement of the child.

Parasitic Index

As a further means of arriving at a conclusion as to the prevalence of the disease in the locality, a parasitic index was established. For this purpose a thick, with a corresponding thin, smear was made from each person willing to have it done. As the smears were taken they were numbered with an ordinary soft lead pencil by writing direct into the dried blood the serial number of the individual, which corresponded to the history index number. In this way 1,216 were taken which was 82 per cent of the population living at this time in the intensive area. From the tabulated summary of the blood examinations made it was found that 31.57 per cent of the whites were infected, considering all ages, and 37.88 of the colored. The Tertian type of infection predominated.

places, extent of breeding, presence of natural enemies of the mosquito larvæ (top feeding minnows, water beetles, etc.) were prepared for each collection of water found to breed, and while the evidence given, as based on the data obtained and the phenomena thus far observed, is believed to indicate very strongly that certain factors regarding the propagation of mosquitoes, their ability to transmit malaria and the maximum period for biting will hold good in the tidewater section, the results are by no means considered conclusive, and it is expected that the studies will be continued in order to modify, confirm, or reject the findings so far observed. To do this successfully the studies will be continued throughout the entire mosquito season.

Prevalence of the Disease In the Intensive Area During 1921

From the foregoing data as to the prevalence of malaria, as manifested by the history and parasitic indices, it will be seen that approximately fifty to sixty per cent of the people actually suffered with clinical manifestations of the disease during the year, or were found upon blood examinations to have the parasites in the peripheral blood. The degree and severity of the infections vary

Parasitic Index—Intensive Area, 1921

WHITE				COLORED			
Male	Female	Positive	Negative	Male	Female	Positive	Negative
346	335	215	466	296	319	233	382
Percentage positive 31.57%				37.88%			

Outline of Field Studies Conducted With Reference to the Local Anopheles

Realizing the importance of more detail information regarding the anopheles of the tidewater sections before beginning active control, careful mosquito surveys were made. During the course of the survey, larvæ were collected wherever they were found breeding, field notes as to the character of the breeding

according to the social status of the different families. The well-to-do were found to suffer much less than those of low social status. For example, all the circumstances which were found to bring about an increased exposure to infection, or bring about close association between those found to be carriers and the non-infected, enhanced both the prevalence and severity of the disease.

Control Measures

With the necessary data at hand relative to the prevalence of the disease in a representative area of the county, the State Board of Health, in co-operation with the International Health Board of the Rockefeller Foundation and the county officials, installed a control campaign, under direction of the writer, during 1922, using for comparative purposes the data collected in 1921, relative to the prevalence, with that collected during the control campaign. The magnitude of the task was recognized by all having an interest in formulating the program and was considered an experiment until the efficacy of the methods employed were thoroughly tested.

After a most careful and diligent study of all the factors concerned in the transmission of malaria in the county, it was decided that the line of attack which would give the most promising results would be the sterilization of the human carriers, and it was upon this one endeavor that the major portion of time and energy was spent. The procedure followed by the Department is therefore given in detail.

General Procedure

The survey area was divided into units of convenient size, letting the small villages constitute the center of each unit, thus forming five distinct working units.

Special effort was made to get the people together at the center of each unit, where stereopticon lectures were given on malaria, its cause, mode of transmission, with special reference to quinine as a curative and preventive agent. The object of the campaign was fully explained in each instance and the value of quinization stressed. The day following each lecture, individual instructions were mailed to those living within the area, specifying whether or not they were found infected during the fall of the previous year and the exact amount of quinine to be taken and for what length of time. In this way each member of the family received written instructions.

All of those who gave a positive history of repeated periodicity during 1921 were regarded as infected and to this list, also, was added those found upon blood examination to be infected. For those giving a negative history and whose blood was not found to contain parasites, they were regarded as non-infected and so treated.

The entire area was covered in this way during a period of ten days, with every individual having been advised to adhere to the instructions given, a copy of which was furnished the field workers for reference.

Drug Therapy

The method of treatment employed was that proposed by the National Malaria Committee, as the "Standard Treatment" for malaria. The following is the exact method:

Under 1 year of age, $\frac{1}{2}$ grain; 1 year, 1 grain; 2 years, 2 grains; 3 or 4 years, 3 grains; 5, 6, or 7 years, 4 grains; 8, 9, or 10 years, 6 grains; 11, 12, 13, or 14 years, 8 grains; 15 years or older, 10 grains.

Distribution of the Drug

All parties receiving instructions as to the amount of quinine to be taken were requested to take the written recommendations to the quinine station in the unit, where the instructions were filed by the station keeper, usually at a grocery store. The keeper had been previously instructed as to the proper dosage of the drug, should bulk quinine be desired, and the amount required for the full eight weeks treatment for each age. They were urged to carry a fresh supply in stock at all times, this being facilitated by furnishing them with a quantity list each month as to the probable amount of the drug that would be required for their special control unit the following month. The estimate as to the amount of the drug was obtained from copies of the instructions issued.

The people were notified where the drug could be obtained and at what cost.

Treatment of Indigent Cases

In all cases except the truly indigent, the drug was purchased by the people themselves from the stations installed in their particular unit, but there were found a certain number who, for the lack of funds, could not purchase the desired amount for the family. In order to care for these, the Director requested private and public subscription for funds, in order that the indigent cases might also receive treatment.

The response in furnishing funds was exceedingly gratifying and all such received an opportunity to procure the drug free of cost. The station keepers furnished the drug in such cases at wholesale price.

Follow-Up System

The field workers were supplied with exact copies of all instructions issued to the various families, and house-to-house visits were made every two weeks to insure the following of the directions. This further encouragement not to discontinue treatment was found to be well worth the time and money spent for the purpose, and should be begun as early after issuing the initial instructions as possible.

After the eight weeks treatment for those reported infected had been completed, they were then urged to begin prophylactic treatment, consisting of five grains each night until November 1st (proportionate dosage for children). In this way all were instructed to take quinine for the entire season.

Comparative Re-survey of Intensive Area, 1922

At the conclusion of the control program, November, 1922, twelve months after the initial survey, a detail survey of the control units was made in order to determine what, if any, results had been obtained through the intensive use of quinine.

This re-survey included 1,441 persons living in the area at the time and consisted in taking blood smears from all those willing to have it done. (The history index was obtained from the records prepared

during the control program of all clinical cases.)

The examinations of 1,197, or 82 per cent of the population, showed that 6.3 per cent of the whites and 12.7 per cent of the colored were found infected, as compared with 31.57 per cent of the whites and 37.88 per cent for the colored twelve months previous to control measures. This shows an apparent mass reduction of 80.4 per cent in the incidence of the whites and 66.47 per cent for the colored, as determined in this manner.

Analysis of the clinical cases for 1922 shows that 142 of the whites, or 19.4 per cent of the total population, and 184 of the colored, or 25.95 per cent of the total colored population, had either chills and fever or other clinical manifestations of the disease during the year, in contrast with the high history indices of 49.79 per cent for the whites and 54.07 for the colored during 1921.

This gives a reduction in the incidence for the area, as determined in this way, of 61 per cent for the white population and 53.05 per cent for the colored.

A survey to determine what, if any, increase in the sales of quinine during the two comparative years showed that during 1921 the storekeepers reported sales to the extent of 857 ounces, and that during 1922 the sales increased to 1,389 ounces, an increase of 532 ounces during the year. This does not include that prescribed by physicians or that furnished to indigent cases.

Conclusions

The results to be obtained with this method of control where anti-mosquito measures are not applicable are exceedingly encouraging but will depend upon how well the people take the treatment, which in turn, as is the case in all matters of public health work, will depend upon the ability of the field workers to secure the co-operation and support of their people.

The efficacy of the method has been sufficiently proved that its prac-

ticability of application on a large scale is yet another problem, the solution of which will be solved only after several years of experience. What the ultimate reduction in the incidence of the disease, as a result of the accumulative effect of the general use of the treatment, remains

yet to be seen; however, by its constant use over a period of control are applicable, will undoubtedly bring about such a marked reduction in the number of carriers that even in the presence of large numbers of anopheles, the progress of transmission will be greatly retarded.

MEDICAL HISTORY

(Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.)

THE MALARIAL FEVERS

Under the general name of malaria, a word meaning literally "Bad Air," medical science has designated a group of fevers, which has probably resulted in greater economic loss than any other disease entity in medical history. It is a known fact that for at least two thousand years the ravages of malaria have caused the destruction of cities, kingdoms, and empires, in many parts of the earth. Just how long the disease has been known and recognized, nobody knows. It is very probable that the ancient Egyptians were familiar with at least some of the manifestations of the disease, because its annual recurrence is noted in at least one place in inscriptions upon the ruins of temples. The disease has always been associated with swamps and marshes; hence the name, "bad air." One of the original designations for the disease was "marsh fever"; another, "jungle fever," and still another, "gnat fever." The latter name indicates that it was long ago suspected that insects have a part in the transmission of disease. One of the most persistent notions regarding the causative factor of malaria is that it is contracted through the inhalation of some kind of poison air emanating from swamps and marshes. Miasma, it was called.

Craig says: "During the darkness and superstition of the Middle Ages no additions were made to our knowledge of malaria, and it was not

until the middle of the seventeenth century, when cinchona bark was introduced into Europe, that an impetus was given to the study of these fevers."

Thus it may be said that the first definite advance in the intelligent treatment of the disease was the beginning of the use of cinchona (quinine), which was first commenced in Europe in 1640. This substance was soon recognized as a specific for the disease, and constitutes today the only treatment worth while for malaria. Although in quinine the world had a specific drug, recognized as such, with which to combat malaria, little progress in the control of the disease as a public-health menace was made for more than two hundred years. The next important epoch in the history of the disease was the discovery in 1880, by Laveran, a French army surgeon, of the plasmodia, or parasites which cause malaria. Following this discovery, and working on the belief of Patrick Manson and other scientists, Sir Ronald Ross, about 1897, succeeded in proving that malaria is transmitted by mosquitoes. In 1899 several Italian investigators corroborated this discovery as especially applied to man. While the theory that malaria may be transmitted by insects was held a long time, at least one scientist believing in it fully as early as 1848, it is to Ross, an English scientist, that the world is indebted

for the first definite proof of the fact. A high official of the United States Public Health Service, in a speech some ten years ago, asserted that there is a fund of \$40,000 in gold deposited in a bank vault at Washington to go to the individual who can succeed in proving that malaria in any of its forms can be transmitted in any other natural way than through the bite of a mosquito.

When the French undertook to dig a canal across the Isthmus of Panama it is said that they lost 50,000 men from mosquito-borne diseases, and that 100 out of each 1,000 men sick from malaria died. The failure of the French was due to malaria and yellow fever. Their project failed, even though they knew how to treat malaria, and they knew its specific cause; but they did not know that it is transmitted by mosquitoes. When the United States was getting the construction of the canal well under way in 1906, "out of every 1,000 employees there were admitted to the hospital from malaria \$21."

Under control measures this morbidity was rapidly decreased each year, until in 1914 only seven employees were admitted to the hospital in the Canal Zone. The death rate from malaria among canal employees had decreased to .11 per one hundred thousand in 1918 against North Carolina's 6.6 in 1922. It is only fair to add, however, that for every dollar expended in North Carolina in control measures, the United States government probably spent one hundred in the Canal Zone.

Malaria is a very old disease, widely distributed over the earth; the cause is definitely known; its mode of transmission is thoroughly understood; it is a disease that may be completely controlled with relative ease, if not eradicated; and it is one of the few diseases for which there is a specific cure. But it is a disease that emphasizes fully that "public health is purchasable," and that freedom from its decaying influences can only be obtained at the price of "eternal vigilance."

MALARIA: A CATECHISM

By H. R. CARTER, M.D.

Senior Surgeon, U. S. Public Health Service
(Supplement No. 18 to the Public Health Reports)

MALARIAL FEVER AND ITS CAUSE

Q. What is malarial fever?

A. A disease of man, common in hot, wet countries.

Q. What is malarial fever sometimes called?

A. Chills and fever, bilious fever, swamp fever.

Q. Is this disease found in the United States?

A. Yes. Along the coastal plain, from Connecticut to Texas, over nearly all of the Mississippi Valley, and in a number of valleys on the Pacific coast.

Q. What causes malarial fever?

A. The presence of certain small organisms in the blood of the person who has the fever.

Q. What do you mean by an "organism"?

A. Something that is alive and thus has the power to reproduce its kind. It may be alive as a plant is alive, or alive as an animal is.

Q. Is the organism which causes malarial fever a plant or an animal?

A. It is an animal, and in the blood is said to be an animal parasite.

Q. What do you mean by a "parasite"?

A. An animal or plant that lives at the expense of another, like the mistletoe, love vine, rust on corn, or the hookworm, flea, etc. The malarial parasite lives in man only, by feeding on the blood cells of the man.

Q. How do you know that these parasites are found in the blood of those who have malarial fever?

A. Because with the microscope we can see them in the red blood cells of a man sick with malarial fever.

Q. What do you mean by red blood cells?

A. They are very small bodies floating in the blood, shaped much like a biscuit, with thickened edges; they give the blood its red color, and are a most important part of it. They are essential to life.

How Malarial Fever is Taken

Q. How do these malarial parasites get into the blood?

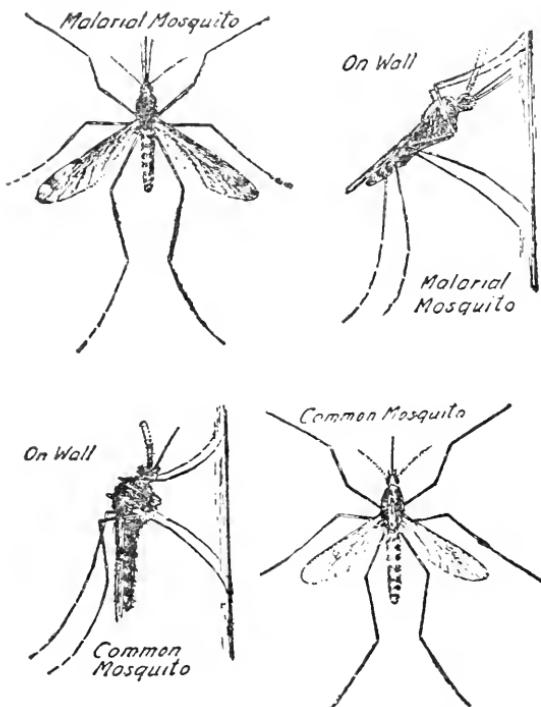
A. In one way only—through the bite of a mosquito. Malaria is not acquired by eating improper food, by drinking bad water, by bathing in the sun, or in any other way than by the bite of

Q. Are mosquitoes born with this power of conveying malaria?

A. No. They acquire it only by biting a man who has these parasites in his blood. The parasites are taken then from a man by a mosquito, and go back from the mosquito to another man. Where the parasite first started we do not know.

Q. How, then, does malaria spread?

A. Exactly like yellow fever. A female mosquito of a certain kind feeds on a man infected with malaria and sucks up blood with malarial parasites in it. She cannot convey malaria to those whom she bites for some days (a week or more) after this, but after waiting a while (the reason for which



a mosquito. True, if one already has malaria—that is, *has these parasites already in his blood*—doing these things will develop it, "bring it out," so that he may have a malarial attack which he could otherwise escape, but only if he is already infected with malaria.

Q. Do all kinds of mosquitoes transmit malarial parasites to man?

A. No. Only Anopheles mosquitoes carry malaria, and only some kinds of Anopheles.

will be told later) she injects these parasites into other men whom she bites and infects them with malarial fever.

Q. What, then, is necessary to spread malarial fever?

A. Anopheles mosquitoes; malarial parasites and healthy men. The parasites may be either already in the infected mosquitoes or in infected men, from whom the mosquitoes can get them by biting.

How to Tell Malarial Mosquitoes

Q. Do both male and female mosquitoes bite?

A. No. The female bites. It is doubtful if the male ever bites.

Q. Can you describe the head of a mosquito?

A. All mosquitoes have a bill and two *palpi* (*pal-pee*), which lie close to it, one on each side. Outside the palpi are two *antennæ* (*an-ten-nay*), which spread apart. The antennæ of the male are plumelike. Those of the female are not.

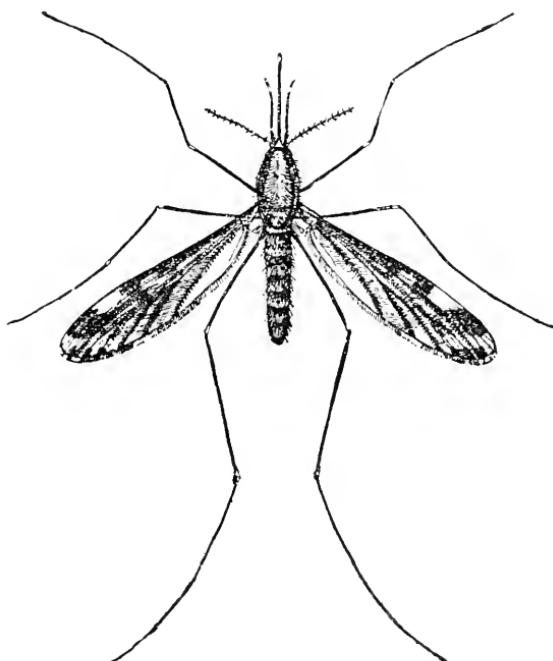
and *Anopheles* have long palpi, and one cannot tell the species of the males in this way.

Q. Are there any other differences?

A. The malarial mosquito is slight and graceful. The wings are generally spotted or dusky.

Q. Is there any other difference to note?

A. Yes. The way of resting on a wall. *Anopheles* rests in a straight line, frequently standing on her head. The others rest "humped up." This is the only way that can be used to tell



ADULT OF ANOPHELES: *Anopheles punctipennis*. Enlarged
(Courtesy Dr. L. O. Howard)

Q. How, then, can you tell the male from the female?

A. The male has "plumes on his head."

Q. How can you tell the Anopheles, malaria-bearing, mosquitoes from the Culex and other kinds in the United States which do not convey malaria?

A. One way is by their heads. *Anopheles* have straight bills and palpi nearly as long as their bills. The female of the other kind have short palpi, except one kind which has a curved bill. The males of both *Culex*

the live mosquito, and is the one usually used in practice.

Q. Can you tell something of her habits while feeding—on man, I mean?

A. She rarely bites in the daytime in the United States. The day mosquito of the South is *Edes* (or *Stegomyia*) *calopus*—the yellow-fever mosquito. *Anopheles* is shy and easily driven off, and will rarely bite one who is moving about; hence is most apt to bite one who is asleep. Her bite is less painful than that of other mosquitoes, and she does not sing so loudly. On this ac-

count, when mosquitoes are much complained of, they are rarely Anopheles, and there can be many Anopheles about without much complaint.

Breeding of Mosquitoes

Q. Where do these mosquitoes breed?

A. In water—in still water and in the pools and grassy edges of running water.

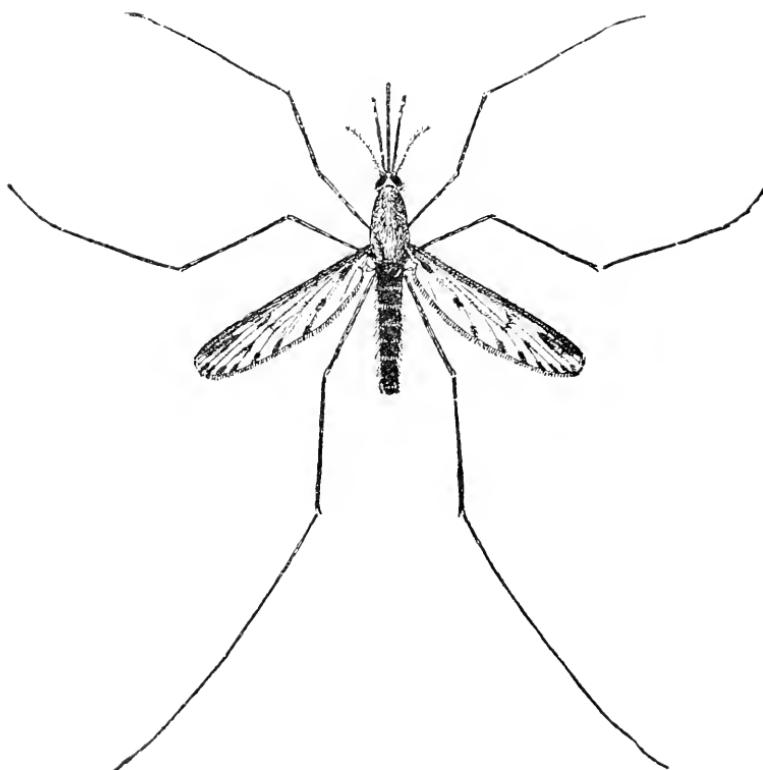
Q. How do these mosquitoes breed?

A. They lay their eggs on the surface of the water. These eggs float, and in a few days hatch into larvae, or "wig-

water, and for Anopheles will take from 12 to 16 days in summer weather—longer in cool weather.

Q. Can one tell the larva of Anopheles?

A. Yes. The Anopheles larva lies at the top of the water and parallel to it, for all the world like a basking pike. The larvae of other mosquitoes hang from the top, head downward. If the latter are touched, they will always dive. If the Anopheles larva is touched, while it may dive it will generally "scoot" backwards along the top



Anopheles crucians. Enlarged
(Courtesy Dr. L. O. Howard)

gle-tails." These live in the water, and in time turn to pupa, or "tumblers," which turn into mosquitoes. There are four changes in the development of mosquitoes, just as for butterflies: the eggs for both; the larvae in place of the caterpillars; the pupa in place of the chrysalis, and the mosquitoes in place of the butterflies. For mosquitoes all these changes must take place in

of the water. They are not a bit alike, and once seen no one will ever mistake one for the other.

Q. Is it important to recognize the larvae of Anopheles?

A. Yes; it is far more important to recognize the larvae of Anopheles than the mosquitoes themselves, because this enables us to find their breeding places and hence to destroy them.

Q. In what kind of places do Anopheles breed?

A. They prefer to breed in *clean* water, in small, shallow, shady pools with grassy edges; if with grass growing in them, so much the better. A marshy piece of ground with many small pools, among bulrushes and sedge, is an ideal place. The grassy edges and quiet pools formed by obstruction on small streams are also favorite places, as are cattle tracks. They have no objection to running water unless running swiftly.

Q. Do they breed in such places only?

A. They *occasionally* breed in almost any collection of water, unless it is very foul; shallow wells, water barrels, tin cans, etc., especially if they have leaves or grass in them or the green algae—"frog moss." Generally, however, they avoid barrels, cans, and other artificial containers, unless they have grass, moss, etc., in them.

Q. How long must a pool last to breed Anopheles?

A. Since it takes usually about 14 days for the egg to produce the mosquito, if a collection of water dries up completely in less than 14 days, it is not apt to breed mosquitoes.

Malarial Parasites in Man

Q. When a mosquito injects malarial parasites into a man's blood, what becomes of them?

A. The parasites which she injects enter the red blood cells. They are then extremely small. They grow by feeding on the blood cells, and get bigger and bigger. Then their edges become scalloped. Then they divide into a number of wedge-shaped pieces, meeting in the middle something like the slices of a pie. Then the blood cells break up and set the young parasites free, and each one of them starts off as a new parasite on its own account and tries to enter another red blood cell and repeat the process of its mother parasite.

Q. Into how many parts does a parasite divide?

A. Into from 8 to as many as 24 or 32, according to the kind, so they may increase very rapidly.

Q. Are there different kinds of parasites?

A. Yes; there are at least three kinds, each of which produces a different form of malarial fever.

Q. How long does it take from the time the parasites enter a red blood cell until they divide into daughter parasites?

A. It depends on the kind of parasite. One kind, the *tertian*, takes about 48 hours, or two days. Another, the *quartan*, 72 hours, or three days. A third, the *estivo-autumnal*, from about 24 to 48 hours. This last form is much less regular in its time than the other two; indeed, two different forms may be included under this name. It produces the worst kinds of malarial fever.

Q. What causes the chill and fever of the man with malaria?

A. When the infected red blood cells break up, they liberate not only the bunch of daughter parasites, but a small amount of poison which the parasites have formed, and, when a large number of them do this at the same time, this causes the chill and fever of the sick man, which occur just after the cells break down. It has been estimated that at least 150,000,000 of parasites must divide at the same time to liberate enough poison to produce a chill—generally many times more than this.

Q. Do all parasites in the red blood cells divide into others, as you have described?

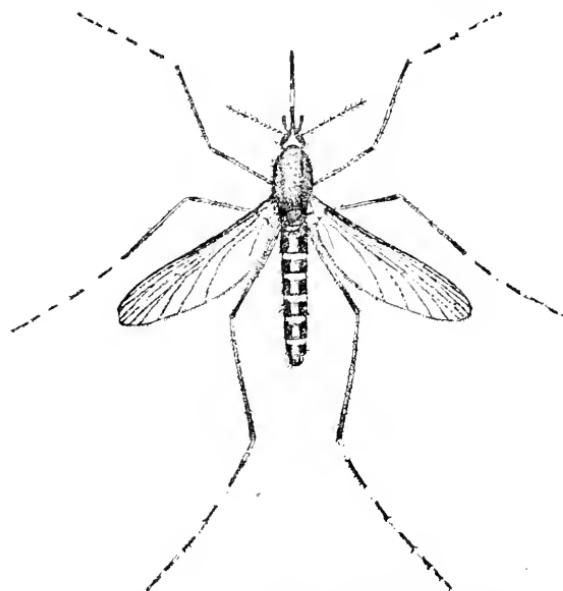
A. No. Besides the sexless forms which divide and produce chills, there are two other forms of the malarial parasites in the blood cells. These are the male and female forms of the parasites. These do not seem to affect the health of the man in whose blood they exist, but it is by means of these that the mosquito becomes infected when she sucks them up.

Q. How does the mosquito become infected with malarial parasites?

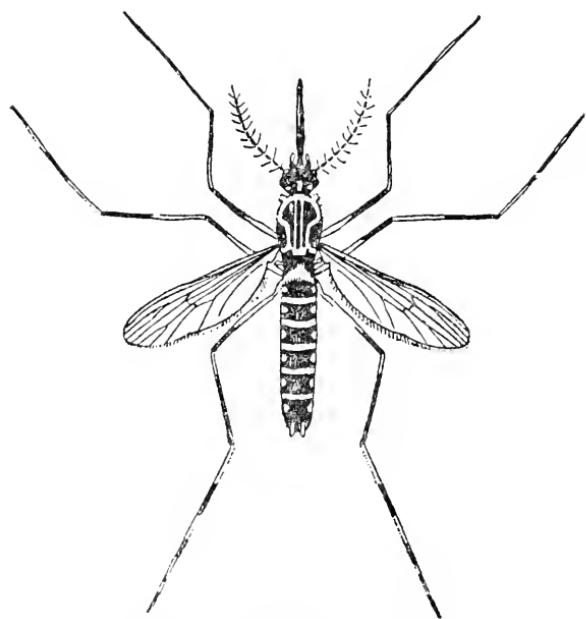
A. If the mosquito sucks up only sexless parasites with the blood, she will not become infected, no matter how many she takes. If, however, the proper kind of mosquito takes up the male and female forms of the parasite, they join together in her stomach and pass into her stomach wall, where they grow. After some time the bodies thus

formed break and set free many young parasites, some of which finally find their way to the mouth of the mosquito. There the parasites are mixed

with her saliva and are injected into a man when she bites him; then they enter the blood cells and start their life all over again.



ADULT OF CULEX: *Culex sollicitans*. Enlarged
(Courtesy Dr. L. O. Howard)



Stegomyia calopus. Enlarged
(Courtesy Dr. L. O. Howard)

Malaria—Lessons on Its Cause and Prevention

Q. How long does this change take?

A. From 7 to 14 days in the summer. It takes longer in cool weather than in hot.

Q. Is the mosquito dangerous to man until this change is completed?

A. No. Until the parasites reach her saliva the mosquito cannot inject them into the person she bites. She is not dangerous, even if she has bitten a man with malarial fever, until the time necessary for this to happen has passed.

Q. Do the parasites growing in the mosquito make her sick, as they do a man in whom they grow?

A. No. The mosquito seems to be as well as ever.

PREVENTION OF MALARIA

Q. Can malarial fever be controlled or prevented?

A. Yes.

Q. What can be done to lessen or get rid of it?

A. There are several methods which can be used.

First. By getting rid of the Anopheles mosquitoes which carry it.

Second. By not letting these mosquitoes get to well people to bite them.

Third. By so treating men having malarial parasites in their blood that they will not infect the mosquitoes.

Fourth. By so protecting healthy people that even if they are bitten by infected mosquitoes they will not develop malarial fever.

First Method—Getting Rid of Anopheles

Q. How do you get rid of Anopheles?

A. By destroying their shelters and their breeding places.

Q. What do you mean by their shelters?

A. Anopheles live mainly out of doors, and as they cannot bear the hot sun, they shelter themselves in the brush and high weeds all day and come out at dusk to feed.

Q. What should be done to these shelters or hiding places?

A. All brush and high weeds near one's house should be cut down, so that mosquitoes cannot shelter themselves close to it.

Q. What should be done with the brush about their breeding places?

A. This should also be cut down.

Q. Why?

A. First. So we can see the breeding places to destroy them.

Second. So the sun can get in and dry up some of the breeding places.

Third. The less brush left to shelter mosquitoes, the better; for if they are exposed to the hot sun many of them die.

Q. How do you destroy their breeding places?

A. In two ways:

(1) By draining or filling up the pools, marshes, etc., in which they breed.

(2) By oiling such pools as we cannot drain or fill.

Q. How does draining or filling up pools prevent breeding?

A. By leaving no water in which they can breed.

Q. How does oiling the pools prevent breeding?

A. It kills the larvae.

Q. How does it kill the larvae?

A. They oil forms a layer on the surface of the water. Now, the larvae must have air to breathe, even if they do live in the water, and they come to the top to get it, and as they cannot get through this layer of oil to get air, they die. Try it on a water barrel with wiggle-tails, and see.

Q. How often should this oiling be done?

A. Once in 12 or even 14 days would be often enough, but it is best done once a week on the same day of the week, so that it will not be forgotten. Use enough oil (coal oil or kerosene) to form a layer all over the surface, so that you can see it.

Q. Can all pools be oiled advantageously?

A. No. If there be much grass in the pool, the oil will not form a layer all over it. If the pool be large—that is, a pond—the wind will blow the oil over to one side, so that the surface on the other side is not covered. On large pools and grassy pools, oil cannot be depended on.

Q. Is there any other way besides oiling in which the water of pools, ditches, etc., can be made unfit for breeding Anopheles?

A. Almost anything that makes the water foul and bad-smelling will prevent Anopheles breeding in it, such as soapsuds, dyestuff, gas tar, refuse from mills, etc.

Q. What of water in barrels, drinking troughs, cans, etc.?

A. Where water is often disturbed, as in chicken and horse troughs, Anopheles are not found or very rarely found; nor are they commonly found in barrels or in artificial containers of any kind, but they are sometimes, and if the water is not needed it is best to turn it out or oil it, or even put in a large amount of salt, as it may breed Anopheles, and will breed other mosquitoes, which are a nuisance if they do not give one malaria.

Q. Have Anopheles larva other enemies besides man?

A. Yes. The "top minnows" that are so abundant in some of our small, sluggish streams eat large numbers of them. In places where these minnows can get at them, Anopheles larvae are rarely found. Where there is grass or brush in the water, frequently the fish cannot get to the larvae. These "top minnows" are our most efficient allies in our fight against these mosquitoes. Big fish are of little value—indeed, do harm by eating the minnows.

Second Method—Preventing Access of Anopheles to Well People

Q. How do we prevent Anopheles mosquitoes getting to healthy people to bite them?

A. (1) By screening the house; (2) by mosquito bars.

Q. How should a house be screened against Anopheles?

A. The screen should be No. 16 wire or No. 14 painted over to lessen the size of the mesh. All windows should be screened, and all doors, if they are left open after dusk. All holes of all kinds by which mosquitoes can enter the house should be screened or closed, including the chimney. Screen doors should open outward. People should stay indoors after dusk, where mosquitoes cannot reach them. Anopheles rarely enter a house in broad daylight. Screens with holes in them, or that do not fit tight, may do harm rather than good, and be "mosquito traps."

Q. How may such screens do harm?

A. Because Anopheles mosquitoes try to enter a house all night long and thus have time to find the smallest opening in the screening. They try to leave the house at first light, and if they cannot find the way out before broad daylight they are trapped in the house and hide in dark places, closets, under the bed, etc., and thus accumulate in the house.

Q. How should mosquito bars be used?

A. They should be of fine bobbinet, with no holes in them and *with no slit up the side*. They should not go over either the head or the foot piece of the bedstead at night, but be tucked under the mattress all around and never allowed to hang down to the floor. They give some protection, but far less than good screening.

Third Method—Preventing Infection of Mosquitoes

Q. How can we treat men with malarial parasites in their blood so that they will not infect mosquitoes?

A. In two ways: (1) By treating every one who has these parasites in his blood until he is *cured* completely—not just partly well—to relapse later. This is the doctor's business. (2) By keeping these people in a screened house, or at least under a mosquito bar at night, as long as they have these parasites in their blood.

Q. Do people have parasites in their blood only when they have malarial fever?

A. No. A man may have parasites in his blood and be infective to mosquitoes which bite him and yet show signs of sickness. People are apt to have parasites in their blood for some time—days, weeks, or even months—after an attack of malarial fever.

Q. How do you explain that?

A. (1) It takes a large number of parasites to make enough poison to produce fever, the number differing for different people, and one may have many parasites and yet not enough to produce fever. (2) The sexless parasites which divide are the only ones which produce fever, and there may be only a moderate number of these in one's blood and yet enough male and female forms to infect mosquitoes.

These last, you know, are the only forms which do infect mosquitoes.

Q. What are the people called who are well and yet are infective to mosquitoes?

A. They are called "carriers," and spread malaria in a community just as a sick man does.

Fourth Method—Immunizing People Against Malarial Fever

Q. How can we protect the healthy men, so that even if they are bitten by infected mosquitoes they will not develop malarial fever?

A. By the use of quinine.

Q. How is this done?

A. If quinine is taken by anyone in small doses during the malarial season it will generally prevent him from having malarial fever.

Q. How much must be taken?

A. Generally, in the United States, 4 to 5 grains every day will be enough. Where the fever is bad, as much as $7\frac{1}{2}$ grains may be necessary, but even $2\frac{1}{2}$ or 3 grains a day will prevent a great many fevers. It is best taken after meals, in one dose or in divided doses.

Q. Must the quinine be taken every day?

A. No. It can be taken in larger doses, as 8 grains twice a week or even every five days. The first plan, we think, is the best.

Q. Does the quinine taken in this way injure those who take it?

A. No. It has been taken thus by many people for a number of years, and none are known to have been injured by it.

Q. Does it make the people who take it feel badly?

A. There are a few people whom even a very small dose of quinine makes feel badly, but generally it does not. There are very few people who cannot take enough to prevent malarial fever. Sometimes when quinine makes one feel badly at first the bad feeling will disappear if he continues to take it.

Q. What is the dose for children?

A. About one-half as much as for grown people; less for small children.

Q. What is the best preparation for children?

A. The tannate of quinine is much less bitter than the other preparations.

Made up into chocolates, it is not especially disagreeable to take. It is also less apt to make grown people feel badly than other preparations.

Q. What is the dose of the tannate of quinine?

A. About two and one-half times as much as of the ordinary kind—the sulphate.

Q. Do people prevented from developing the fever by these small doses of quinine ever have parasites in their blood?

A. Yes. Unfortunately, sometimes they do. To what extent this occurs, and to what extent the quinine prevents the parasites from developing in the blood, is not yet determined.

Q. Are all people not protected by quinine liable to develop malarial fever when bitten by an infected mosquito?

A. No. Some men seem to be naturally *insusceptible* to malaria. They are probably very few. In other men the having had a number of attacks of malaria produces an insusceptibility, or at least a lowered susceptibility, to the disease, and they do not under ordinary circumstances develop it. We frequently find in a malarial country families in which the children are having fever, while the old people are not. They have had many attacks in past years, and are now not susceptible to malaria. Sometimes a severe accident or a spell of sickness may render them susceptible again.

Q. Is malarial fever liable to relapse?

A. Yes. Untreated, or imperfectly treated, it is almost sure to relapse, and to relapse several or even many times. The infection frequently lasts over from one season to another, the man being well for months between the attacks. It has been known to relapse after two years interval. Many of the attacks of fever in a malarial country are relapses and not new infections. All those that occur in the winter and up to June or July are probably relapses.

TO LIVE LONG

To be free-minded and cheerfully disposed at hours of meat, and of sleep, and of exercise, is one of the best precepts of long lasting.—Lord Bacon.

MALARIA AN ECONOMIC PROBLEM

By F. M. REGISTER, M.D.

Malaria is a disease that has been talked about and written about for ages. The reason that the prevention of malaria has not been taken more seriously by the masses of the people is because malaria is not so deadly, or spectacular as some other diseases, but rather a chronic disease, tending to disability rather than early death. We know that each malarial parasite destroys a red blood corpuscle. If this were kept up for any length of time death would be inevitable and speedy. Malaria plays with its victim not unlike the cat plays with a mouse—freeing its victim at regular intervals, then grasping with a stronger hold till finally the end comes.

There is a certain degree of immunity established in each individual infected by malaria, but in establishing this immunity the individual is weakened, mentally and physically.

The whole impress of malarial infection is stamped on each community where malaria exists. The loss by malaria is not as great in deaths as in general weakness, inertia, and lassitude of the persons who are infected with malaria. A great many historians give malaria as one of the great and moving factors in the fall of Rome. The Romans became highly infected with malaria which sapped their moral fiber and physical and mental energy. Of course malaria was not the only cause of the fall of Rome, but there is no doubt that it played a great part. It is known that the failure of the French to dig the Panama Canal was not because of the lack of funds, or good engineers, or laborers, but because of lack of knowledge that malaria and yellow fever are carried by mosquitoes. Their engineers, doctors, nurses, and laborers died by scores and hundreds from sicknesses carried by mosquitoes. The reason the United States built the Panama Canal was because this coun-

try had a Gorgas to direct the carrying out of sanitary measures. The proposition of building the Canal was then simply an engineering problem. Anyone who has traveled through a malarial section will not fail to notice the listless attitude of a great many of the people. While they live on the richest lands of the state they simply eke out a bare living. If malaria was stamped out or even controlled, and control is easy and inexpensive, our eastern counties would become the wealthiest and greatest farming section in the United States. The less malaria, the better the farming; the better the farming the less malaria; a complete cycle. Drainage plays an important part in better farming and in eradicating malaria.

It is strange at this good day and hour that there are thousands of people in North Carolina who do not know that mosquitoes and mosquitoes alone transmit malaria, and that quinine properly administered is a specific for this disease. A few days ago twenty intelligent people were interrogated as to how malaria was transmitted. Only three had a clear-cut idea as to the transmission of malaria. The others were more or less hazy. The eradication or control of malaria is a matter of education, for when the people of North Carolina know, then there is no limit as to what they can and will do.

The writer of this article with his family lived on Roanoke river winter and summer for years, in perfect health, notwithstanding mosquitoes were as thick as could be. The reason was that everybody in that particular section took more or less quinine and every house was screened in a thorough manner. Not only were windows and doors screened, but porches, and tops of chimneys as well. Those who were sick with malaria as an extra precaution, had

their beds protected by mosquito netting to keep mosquitoes from biting them and they transmitting malaria to the well. By these precautions

was built up a community of three to five hundred souls, practically free from malaria. This can be done anywhere at small expense.

LACTIC ACID MILK IN INFANTILE DIARRHEA

By ALDERT SMEDES ROOT, M.D.

Pediatrician to Rex and St. Agnes' Hospitals, Raleigh, N. C.

Before Finklestein and Meyers, in 1910, advocated the feeding of infants suffering from acute diarrhea with proteid milk, protein was the food element which, if given in large amounts, was thought to be particularly deleterious. Again, the idea of feeding an acid mixture such as proteid or lactic acid, milk was considered harmful. In fact alkalies for years have been added to cows' milk mixture in the belief that they retarded or prevented the rennet coagulation of casein in the stomach. Such we now know is not the case. The example of Finklestein and Meyers has been followed widely, and increasingly year by year, so that at the present time there is hardly a city of any size in the country where this product is not available for general use, certainly during the spring and summer months.

Since proteid milk is difficult of preparation, and lactic acid milk answers the same purpose in an equally effective way, the latter preparation is the one in general use. The clinical results which one obtains from the use of lactic acid milk needs only to be contrasted with that obtained by other methods of feeding to convince the physician of its superiority as a food in acute infantile diarrhea. In any acute irritation or infection of the gastro-intestinal tract the food given should be one low in fat, low in sugar, and relatively high in protein. A high percentage of sugar is contra indicated because it is fermented within the intestinal tract, resulting in a highly acid product which increases peristalsis. Fats should be withdrawn because they are the most difficult of the elements

of food to digest, and because they ferment into fatty acids of the butyric acid group which also serves to increase peristalsis and irritate the intestinal mucosa.

In this section of the country, practically all diarrhea may be classified under three heads. 1. Simple indigestion. 2. Fermentative diarrhea of the carbohydrate type. 3. Infectious diarrhea, or colitis. In all three of these lactic acid milk is eminently indicated.

Preparation of Lactic Acid Milk

Lactic acid milk is prepared by boiling or pasteurizing milk, cooling this to about 100 F., inoculating it with a culture of lactic acid bacilli, and incubating until the milk ripens. It is then kept refrigerated and given at a temperature not higher than that of the body. The finished product looks and tastes somewhat like buttermilk. Make from skimmed milk the formula is fat 0.50%, sugar 4%, lactic acid 0.80%, protein 3.6%, inorganic salt 0.75%, and with a caloric value of 20 to the ounce. It can be made in the home by boiling a quart of skimmed milk for 3 minutes, cooling to 100 F., adding the culture, and placing the warm inoculated milk into a sterile quart thermos bottle and allowing it to remain until the lactic acid is formed. This will require from 3 to 6 hours. As soon as the milk ripens it should be poured into a sterile vessel and kept cold. If allowed to remain in the thermos bottle for any length of time after ripening it becomes acid and unpalatable. An ounce of lactic acid milk should be saved each day for ripening the next day's milk.

The culture for starting the milk should be a mixed culture of lactic acid and Bulgarian bacilli. These can be procured from the Bulgaricus Milk Ferments Co., 515 N. Charles St., Baltimore. Every one or two weeks a fresh starter should be used, for the lactic acid strain of organisms outgrow the bulgaricus, and as these increase the product becomes more sour and wheys off. It is on account of the whey formation and the acidity that lactone tablets on the market are unsuitable for making the milk.

Value of Lactic Acid

Wherein does the value of lactic acid lie and what proof can be offered of its efficacy? Its value is several-fold. (1) It is low in fat and low in sugar, both of which are contraindicated in any type of diarrhea. (2) It is high in protein, which element is desirable because protein repairs tissue waste, and because when protein undergoes putrefactive changes in the intestinal tract the product is alkaline in reaction. This alkalinity neutralizes the acid condition existing in the intestines in most of these diarrheal conditions. (2) The protein in the process of fermentation is finely broken up and hence more digestible. (4) The lactic acid organisms have an antagonistic action upon the organisms causing the disease. (5) Food taken into the stomach must be rendered acid before it enters the intestinal canal if it is to be digested. Since the hydrochloric acid is always decreased in any intestinal upset, the stomach contents are not acidulated. The value of an acid food, therefore, is evident. (6) Lactic acid inhibits the growth of micro-organisms.

Heiman studying the germicidal effect of lactic acid milk reached the following conclusions:

(1) Some of the acid tolerant cells of *B. Coli* may survive the presence of 0.6 per cent lactic acid in milk. *B. Dysenteriae*, *B. Typhosus*, *B. Diphtheria*, *B. Paratyphosus* and the spirillum of cholera in these experiments were destroyed by the presence of 0.45 per cent lactic acid. It is possible that strains of these bacteria

exist which are able to resist a greater amount of lactic acid.

(2) Acid tolerant strains of *B. Coli*, *B. Dysenteriae*, *B. Typhosus*, and *B. Paratyphosus* may multiply in the presence of quantities of lactic acid which are destructive to the majority of cells. The smaller the initial amount of lactic acid, the more likely the growth of acid tolerant strains. Consequently the slower milk sours, the greater danger of pathogenic bacteria surviving.

It seems to me that the greatest proof of the efficacy of lactic acid milk lies in the fact that it is so generally used all over the country. There is scarcely a city of any size in which it cannot be procured for these cases during the summer months, both in hospitals and at dispensaries. Summer before last the Wake County Health Department undertook to make lactic acid milk upon a large scale so that it would be available to rich and poor alike at the nominal cost of 20 cents per quart. This was made under personal supervision of Mr. Roy Dearstyne, bacteriologist of the Wake County Health Department. It was furnished for any case of diarrhea free of charge provided the parents of the child were unable to pay for it. From the 15th of June to the 2d of October over 400 gallons were dispensed to 125 infants and young children. Three hundred quarts were given to charity cases. Last year a much larger amount was made by the Department of Health and dispensed to over 250 cases and its use has become much more general. I consider this one of the most valuable and progressive pieces of health work which has been accomplished by any county health department in the country. It is my hope that the way is paved for others, and it is gratifying to know that several smaller towns in the vicinity provided for it last summer.

My own results with the use of lactic acid milk in these cases have been in accord with those reported in the literature bearing on this subject. During the past two years, since the County Health Department has been making it, 253 cases I have

treated suffering from diarrhea have been fed upon it, 115 in 1921 and 138 cases in 1922. Most all of these cases were either those of fermentative or infectious diarrhea. Many of these children after having been sick a week or longer were brought into the hospital in an extremely bad condition, some apparently moribund, and many required intensive methods of treatment, viz.: intra-peritoneal injections, blood transfusions, etc., and many required tube-feeding over a period of several weeks. Of the 253 cases mentioned seven died, a mortality of about 2 3/4 per cent.

The product made by the Wake County Health Department proved very consistent. Eighteen titrations for acidity averaged 1.03 and range of difference in acid content was only 0.34 per cent. It is noted that the acid content ranges well above the figure set by Heiman at which pathogenic bacteria are usually destroyed.

Limitations of Lactic Acid Milk

It must be understood that lactic acid milk is not a panacea. There are some cases which do not respond to it, but there are relatively few. It must also be borne in mind that skimmed lactic acid milk should be used as a temporary food on account of its relatively low caloric value. After several days whole lactic acid milk mixtures should be substituted for the skimmed, and malt sugar added to the formula. A convenient form of this is Meade's Dextrimaltose, or, as Marriott advocates, Karo syrup. This is cheaper and has the

same formula as the more expensive dextrimaltose.

It is unnecessary in any child over 5 or 6 months of age to dilute the skimmed lactic acid milk before feeding it. A tangible drawback is that many children do not relish the taste of the milk, especially in those over 12 months of age. The difficulty is often overcome by sweetening the milk with saccharine, about $\frac{1}{4}$ grain to each 6 or 8 ounces. Not infrequently children will have to be starved into taking it and I have not infrequently had to employ the stomach tube in order to effect a beginning. Fortunately when they acquire the taste they like it apparently better than plain cow's milk. Veeder has shown that babies can be kept upon whole lactic acid mixtures for a long period of time just as safely as though they were fed upon unripened milk. In any baby who has had severe diarrhea it is wise to keep him upon lactic acid milk for the remainder of the summer. It would be a good plan to give a certain amount of lactic acid milk to well babies during the diarrhea season as a prophylactic measure.

The effect of the baby's taking lactic acid milk is usually promptly gratifying. The foul putrificative odor so common in these cases ceases and the stools change in character. The hard curd and green color disappear and after a few days there is some body to the stools. The blood, too, from the ulcerations in the ileum and colon in cases of colitis clears up more rapidly. The infant rapidly becomes less toxic and convalescence is less protracted.

THE PREPARATION OF LACTIC ACID MILK

By ROY S. DEARSTYNE

**Formerly Laboratory Director, Wake County Health Department,
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Climatic conditions in North Carolina are such that there exists a certain period during the year when infants under two years of age are susceptible to intestinal disturbances which are classified under the gen-

eral term "diarrhea." This general term may include simple indigestion, fermentative diarrhea, and infectious diarrhea or colitis. So severe is the latter condition that the deaths under two years of age from diar-

rhea and enteritis from 1914 to 1921, inclusive, total 14,013, or an average of over 1,700 annually. This figure does not include the deaths over two years of age, nor the morbidity total. The monetary loss from colitis is enormous, so much so that an organized attempt must be made to meet this condition, prophylactic measures being taken as well as curative.

Colitis is prevalent in this section from about the 1st of May until the 15th of September, according to weather conditions.

To date, the most extensive effort to combat colitis in North Carolina was undertaken by the Wake County Health Department in 1921. In that year, from the 15th of June until the 1st of October, 400 gallons of lactic acid milk was made and dispensed to 125 cases of colitis with uniformly good results. In 1922 this work was continued, the quantity of milk manufactured being doubled, about 250 cases using this milk with the same good results attending. The work is progressing on even a larger scale during the present season of 1923. The success of this dispensary is such that the State Board of Health deems it a practical method of combatting colitis.

Process of Making Lactic Acid Milk (in bulk)

Only the best grade of milk should be used. For the first few days skim milk should be used. If possible, the milk used should be mornings milk, produced and handled under the best of sanitary conditions. On delivery, the milk should be immediately pasteurized by heating to a temperature of 180 degrees F., the milk being constantly agitated during the process. It should then be immediately cooled to 95 degrees F., and inoculated with starter, the amount of starter used being proportionate to the amount of milk to be ripened and the condition of the starter. The milk should be ripened either in an incubator or a sink where warm water is available. The temperature of ripening should be about 95 degrees F. A higher tem-

perature forces the ripening process, producing a milk excessively acid. Ordinarily, if the starter is in good condition, 5 hours ripening will produce a firm, mildly acid curd which can readily be worked into a smooth body. After working into a smooth body, the milk is bottled, capped, and iced. No milk should be held over 24 hours for dispensing purposes. Determination of when the milk is ripe is made according to the development of the curd. Sufficient quantity of the finished product is saved each day for the next day's starter.

Equipment Necessary for Preparation

Necessary equipment for making lactic acid milk in bulk: cans, bottles and caps, milk agitator, suitable sink with running water for cooling purposes; facilities for sterilizing bottles (chemical sterilization with "B-K" compound is satisfactory if hot-air oven is not available); refrigerating facilities.

Making Lactic Acid Milk in the Home

Pasteurize the milk by heating to 180 degrees F., the milk being constantly agitated during the process. Cool to 95 degrees F. Inoculate with starter, the amount used being proportional to the quantity of milk being made (2-3 ounces to the quart). Pour the inoculated milk into a thermos bottle, and let set until a firm curd has been formed (4-6 hours). Pour from thermos bottle into sterile quart milk bottles, working up the milk by pouring from vessel to vessel until a smooth body is formed. Keep the milk as cold as possible, saving enough of the finished product for the next day's starter.

Necessary equipment for making lactic acid milk in the home: thermos bottle, heating facilities, refrigerating facilities, thermometers, milk bottles and caps, and starter.

Initial Starters

Starters for lactic acid milk may be secured from the Bulgaricus Milk Ferments Co., 515 Charles St., Baltimore, Md. Order duplicate starters

to guard against accident. On receiving these tubes of starter, divide the contents of one tube between two quart milk bottles, to each of which is added about 1½ pints of pasteurized milk. These bottles are thoroughly agitated, and the contents incubated until a firm curd is formed. This quantity of starter should be ample to ripen 5 gallons of milk. It is highly necessary to renew starters about every ten days, or better still about once each week.

Points to be Emphasized in Making Lactic Acid Milk

1. The pasteurization should be thorough. A temperature of 180 degrees F. should be attained with constant agitation to insure uniformity of pasteurization. Slighting this process is bound to react against the finished product because of the activation of the surviving bacteria during the ripening period.

2. The milk should not be inoculated with starter at a temperature of over 95 degrees F. Milk at a higher temperature on inoculation with starter will ripen rapidly with an excess of acid.

3. The ripening period should not be hurried. The best ripening temperature is between 90-95 degrees F. In the operation of the Wake County Dispensary, the interval elapsing be-

tween the inoculating of the milk and the dispensing hour is not over 5 hours.

4. Milk should be iced so that it is dispensed at a temperature of not over 50 degrees F. This temperature inhibits further bacterial action on the milk sugar, and holds the acid content constant if maintained in the home.

5. Effort should be maintained to dispense the milk at a constant acidity from day to day. This is done by gauging the physical appearance of the milk as to the formation of the curd, or better still, by titration.

Resume of Two Seasons' Experience in the Manufacture of Lactic Acid Milk

The manufacture of lactic acid milk is a highly technical process, and requires the undivided attention of one person if it is to be dispensed in quantity. It could be handled in small departments if the personnel and equipment were adequate. The dispensary can be made self-supporting exclusive of the technician's salary. In small towns it is practical to conduct this work in conjunction with other public health activities. The financing of such a dispensary should not be a difficult problem if the co-operation of the woman's club and other civic organizations is obtained.

KEEPING PHYSICALLY FIT NUTRITION—CONSTIPATION—TEETH

By ROY C. MITCHELL, M.D.
North Carolina State Board of Health

NUTRITION

What shall we eat? This was the only problem of mankind until Eve ate the forbidden fruit and gave one to Adam and he ate of the same. This brought on the first complication—a new problem was added: what shall we wear? This was solved by Eve's wearing fig leaves—a very scant attire, from our point of view; but this has been solved also by the negroes of the Congo in Africa. They

do not even wear any kind of leaves. But eat we must, and this problem has been a puzzle to mankind for millions of years.

Each nation has its chief articles of diet. In the eastern countries, rice is the staple; in torrid or hot countries, fruits, such as bananas; in the temperate zones, a mixed diet—meat and vegetables; in the Arctic or cold countries, meats and fats. To these different diets the different

mentalities of the nations are mainly due. Fruit eaters in the torrid zones are indolent, lazy, and self-satisfied. When a person gets hungry, all he has to do is to step into the brush and gather enough fruit for his immediate need, and let each member of the family do the same. The death rate about equals the birth rate.

The rice eaters are without ambition, and are virtually slaves. A day laborer in China and India receives from 3 to 10 cents in our money for a day's work. Very little progress has been made by these rice eaters in the last 4,000 years.

The progressive people of the world have been those whose diet consisted of flesh and vegetables—those living in temperate zones, where there are virtually four seasons a year—spring for planting, summer for cultivation, autumn for harvesting, and winter to enjoy the fruits of their labor.

In the cold regions of the world, where the weather is always below zero, are the flesh and fat eaters. The people are the fishermen and sailors of the world. They do no farming or raising of vegetables. These people have added very little to the world's progress, but they are independent and self-sustaining. These were the explorers prior to the fourteenth century, but left very little records of their travels.

The American records date from Columbus in 1492, when he tried to sail around the world and ran into land he had not heard of. The place he landed on he called West Indies, and he gave to the natives he found there the name of Indians, which means with us red men.

Wherever there is life, there is the problem of what to eat. When Columbus discovered America the principal article of diet was maize or corn, potatoes and flesh. He found a robust, athletic people, independent hunters and farmers. The women did the farming and all drudgery. These people have given very little to the world in the shape of making it a better place to live in. They moved south in winter and north in

summer. Their clothes consisted of skins of animals.

Whatever may be the diet of any people, certain ingredients are necessary—starches and sugar, meat or protein, fats, salts, oxygen and vitamins. If any one of these foods are left out, we have what is called an unbalanced diet; growth is stunted, both mentally and physically.

While we never think of these different necessary ingredients in our meals, nearly every article of food we eat contains two or more of them; so in eating some of several different things each day we get the essentials. Up to fifty years ago this was much truer than it is today. The people ate coarser articles of diet, and what we know as nutritional diseases were practically unknown. They ate whole-wheat flour, unbolted corn meal and unpolished rice, raw and cooked fruits and vegetables and fresh milk. Later on, more refinement was added to these essential articles of diet; wheat was bolted and bleached and the heart taken out with all the bran. This gave us what is known as patented flour, and our cooks pride themselves in their snow-white biscuits. This flour has been pulsed, for if kept dry will not get musty. The same process takes the husk and the heart out of corn, so it will keep as meal. Rice is polished, giving us the white rice that you buy in the stores today. Fruits and vegetables began to be preserved for out-of-the-season use. The era of canned goods gradually came on, until now some people almost live out of tin cans. From this time on until now, preserved meats, vegetables, and milk began to appear in all homes. The growing of vegetables and keeping of a cow for home use is gradually dying out, people considering it cheaper to buy canned or dried milk than having to feed and milk a cow twice a day.

Now began to appear with us a new disease—pellagra—a disease due to the lack of something in our diet. What was it lacking? Our agricultural and experimental colleges began work on feeding stock, rabbits and guinea pigs, using these because they could put them in pens

and absolutely control what they ate. They found that they could take a litter of pigs and by feeding could make a runt of one, and big bone of one, and a fat one—all depending on their feed. All had the same parents. Now, the question, what was the cause of this? There must be some cause why one could be made a runt and another kept normal by feeding. They took three pigs and put them in pens, side by side, and fed one on patented wheat flour and boiled whole milk, all he could eat. This made a runt, with slow growth at first, and then no growth. The second pig was put on whole ground wheat and unboiled milk, all he could eat, with the result that he grew rapidly, but failed to grow to full size of his kind, and was always flabby. The third pig was fed on a mixed diet—mill-fed, which contained bran from wheat, crushed corn and soy beans, properly cooked, to which was added skimmed milk and green vegetables. This pig was full of life, very active, energetic, grew rapidly in size, shape and bone, but not fat—what you would call pleasantly plump—and attained full growth in about one year.

Without going into details as to how they found out what was lacking in diet in pigs No. 1 and No. 2, they found the diets lacked several things, which they called vitamines, A, B, C, and D, and salts. Some of these were easily destroyed by heat, as when milk was boiled; others were in the bran of the wheat, as salts and vitamines.

These pigs, when put on a diet of pig No. 3, promptly gained in growth and fat, but never equaled pig No. 3 in size or shape, which proved that when stunted in growth from any cause they can be improved, but never brought up to normal.

Now, the same lack of things that stunted pigs stunts children, and the most common in our country is improper feeding, badly cooked food of proper or improper kind, and infectious diseases. Of the infections, second-summer diarrheas and hook-worm disease are the worst with us. Nine out of ten summer diarrheas are due to improper food or bad

feeding. The mothers do not intend to feed poorly, but they do, and the reason for this is that they do not know how to do any better. No mother wants to have a sick child or raise a runt, but this is what is being done in North Carolina today. Statistics show that one-third of the children of school and before school age are underweight and underfed. Who is to blame for this? It is a fact. Look at the school children as they are gathered in the schoolrooms at your school.

Any parent that fails to report measles, whooping-cough, diphtheria or scarlet fever, or any other contagious disease, is a menace to the community and should be dealt with as a criminal. While their intent is not to hurt their neighbors, they do hurt, and the damage that follows means the stunting of some child—and it may be your child.

Every family that lives in the country should milk a cow and have milk as part of the daily diet of the whole family. Have a garden, and so select the vegetables to be raised as to have several green vegetables growing every month in the year. This is easily done in North Carolina. The family which plants only cabbage and collards, and calls that a garden, has certainly been mentally stunted by an unbalanced diet. This family can be greatly improved by having a milk cow that gives real milk, a garden that contains onions, beets, turnips, carrots, and potatoes. These grow in the ground. Lettuce, spinach, mustard, collards, turnips for salad, garden peas, field peas, snap beans, butter beans, green corn, and tomatoes—these grow above the ground. To these add eggs and chickens raised on the premises, with plenty of home-raised hog meat and home-ground corn meal. In this list has been left out two very essential things—a pump of good water convenient to the kitchen, and a supply of dry fuel near the cook stove. With the above articles of diet in the hands of a fairly good cook who believes in boiling the pot, you need have no fear of not getting the right kind of food for every member of the family from baby to grandma.

Teach the children to eat some of everything put on the table, and drink one cup of "potlicker" as a dessert once a day. In cooking vegetables, the salts are dissolved out in the water used in boiling, and these salts are just as necessary for health as any other part of the food. Suppose you call the potlicker "soup"—the family might drink more of it.

The family that relies on the frying-pan as the chief article to use to cook with are now, and ever will be, tenants, or ordinary laborers. They were stunted in their growth, due to an unbalanced diet.

Have a cow and plenty of fruits and vegetables and good cooking, and you will have the right diet.

CONSTIPATION

The causes of constipation are many. They range all the way from an impassable obstruction caused by an incurable cancer of the rectum to simple carelessness of an otherwise perfectly healthy person. Some cases of constipation are curable and some cases are not curable. Many cases are curable by the patient himself if he knows what to do. And these cases make up eighty-five cases out of every hundred. The remaining fifteen cases in a hundred are those which are due to diseases of organs other than the intestines and require the expert attention of a doctor, some of which are curable and some of which are not. But the eighty-five cases out of a hundred which are curable are the great majority which cause most of the common ills of piles, hemorrhoids, headaches, and sluggish feelings familiar to the chronically constipated person. This large class of cases is due mainly to faulty habits of living which can be corrected and this is, therefore, the class of cases which we will give our attention to.

The faulty habits of living which cause constipation come under three groups: (1) Irregularity of going to stool. (2) Improper food. (3) Lack of exercise.

Irregularity of going to stool is the greatest cause of constipation. The bowels are kept from forming the habit of regular movement. It

is made hard for them to act properly. If a man should lose his watch, and if there were no 12 o'clock whistle, and if he was also unable to see the sun he would nevertheless know when dinner time came. He is in the habit of eating then and in the habit of going to the table whether he is hungry or not. So his stomach has formed the habit of acting at that time and it tells him when dinner time comes. The bowels will form a habit just as the stomach does if they are given a chance to. If one goes to stool after breakfast every morning the bowels get the habit of moving at that time. With the few first attempts no movement may occur. Then the thing to do is to remain away from stool all day, take a laxative at night and go to stool the next morning. Go to stool every morning whether a movement occurs or not. Soon the bowels will form the habit of moving at that particular time. And a good passage will be possible then, although there may not be any strong feeling of necessity before it. With the formation of this habit the majority of the cases will be cured.

Improper food affects the movement of the bowels in two ways: (1) food may not stimulate the intestine enough to arouse it to sufficient action to carry the material in it along fast enough to keep it from damming up and blocking the intestine. Or (2) it may over-stimulate the intestine and arouse it to such strong contractions that it holds the material in it so tightly that it cannot move along properly and it dams up and blocks the intestine. In both cases blocking of the intestine occurs and constipation results.

People who eat concentrated, refined foods are those who suffer from the first type. So much of the food goes to nourishment, and is absorbed from the intestine that not enough bulk is left to stimulate the intestine to normal action. In such cases there needs to be added to the diet coarser foods such as rye and Graham bread, whole wheat bread, cabbage, turnip tops and spinach, cauliflower, Brussels sprouts, prunes, dates and figs, and a limited amount of cider and

buttermilk. The coarse bread and vegetables and acid cider and sour milk tone up the sluggish muscle of the intestine and stimulate it to move its contents along.

But if one uses plenty of these coarse foods and has regular habits of going to stool and still suffers from constipation he may have a sensitive intestine that is being over-stimulated and which is contracting so hard that it is holding its material tightly instead of passing it along. In such cases the condition is often relieved by making up the diet from such soft bland substances as white breads, from patented flour, rice, fruits, macaroni, oatmeal, eggs (always soft cooked), fresh fish, all meats except fresh pork, stewed rhubarb, fresh asparagus tips, stewed celery, squash, small white onions, white and sweet potatoes; among the fats, butter, olive oil, cream, cream cheese, and cottage cheese. These will make some bulk but will not irritate and stimulate the intestine like the coarse foods mentioned for a sluggish intestine.

Lack of bodily exercise allows all the muscles of the body to become flabby and sluggish. The intestinal muscles become sluggish and the bowels become constipated. Since people have begun using their legs only for getting in and out of automobiles constipation has increased. In the days when people used them to walk on and to hold on to horses with there was less. Now it is getting common to find people in their rooms stretching and bending themselves to the music of phonographs in the effort to tighten up their muscles to keep themselves in shape. It would be better to get out and walk or work and use the muscles in doing some natural useful thing. But they should be used in some way, if for no other purpose than that of keeping them in tone.

Sometimes a person is found who is constipated because the intestines are sagging too low and forming unnatural kinks which hinder the free passage of material through them. These people are usually helped by wearing specially designed belts or bandages, which are put on while the

patient is lying down with the organs in place, and which then holds them in place when the patient stands up. They do not always produce a cure, but they often do help.

But the average person who is bothered by habitual constipation has irregular habits and is irregular in going to stool. If he eats the proper diet and takes the proper exercise he will not likely get satisfactory results until he establishes the habit of always going to stool at the same time every day. This one regular habit will do more toward preventing constipation than anything else.

RELATION OF TEETH TO HEALTH

Nature gave us teeth to chew our food. They should be sound and clean. Food must be finely divided to be properly digested in the stomach and absorbed into the body for nourishment. If the teeth are sound and the food is properly chewed this is done. But if the teeth are decayed and the mouth is unclean, the stomach receives poorly chewed food mixed with germs from the mouth and a poor grade of nourishment is furnished to the body. A clean mouth and sound teeth usually mean a clean and a sound body; and a dirty mouth and decayed teeth eventually mean a dirty and a decayed body. Disease germs from infected teeth circulating in the blood stream through the body eventually means the spread of disease to other organs and the premature decay of the body. Give everybody a clean mouth and a sound set of teeth and you will have a healthy race of people.

In order to better understand our problem let us review briefly the structure of the teeth and the accidents to which they are subject. The number of teeth varies according to the age of the person. Their shapes vary according to position in the mouth and according to their use. The front teeth are thin and sharp for cutting the food into mouthfuls. Going backward they become thicker, stronger and flatter until they become grinders for crushing the pieces, cut off by the sharp front

teeth, into very fine bits, to be swallowed and digested. But regardless of the age of the person or the shape and position of the teeth, every tooth is built on the same plan, out of the same material, and requires the same care. So if we understand one tooth we understand all of them.

When you look at a tooth in the mouth you see half of it, the crown. The other half of it, the root, extends downward through the gum into the jawbone. The crown is covered with a hard white enamel. The center of the tooth is hollowed and contains the blood vessels and nerves. If, from breaking the enamel or from neglect, the tooth decays to the center and the nerve becomes exposed, then you have the toothache. The teeth are not dead bones, but living tissues. They have feelings and also require nourishment just as any other organ.

There are three principal tooth disorders which are easily recognized. They are: tooth decay, tartar and pyorrhea. Of tooth decay there are two main causes: sickness, particularly during childhood, from such diseases as measles, whooping cough, scarlet fever and diphtheria, which so weakens the body while some of the teeth are growing that the part of the tooth which grows during the sickness and the weakness following it is defective and decays easily. The other cause of tooth decay is unclean teeth and mouths. When bits of food are allowed to lodge on or between the teeth, they ferment and form acid in a manner similar to the formation of vinegar or the souring of milk. The acid formed in this way attacks the tooth and in the course of time a place, probably a section already weakened by some childhood disease, yields to the dissolving action of this acid and the tooth decays. To avoid tooth decay, the mouth and teeth should be kept clean and every tiny spot of decay filled at once by a dentist.

Tartar is a deposit of lime-like material from the saliva mixed with food particles which forms around the necks of the teeth at the edge of the gums. These deposits cannot be seen at first, being usually on the

inner surface of the lower front teeth or on the outer surface of the upper teeth. These deposits cause the gums to become swollen, sore and bleeding. Later the gums draw back and leave more delicate parts of the teeth exposed to agents which cause their decay. If this is allowed to continue, pus forms around the teeth and pyorrhea develops. To avoid tartar, the teeth should be cleansed by thorough brushing at least twice a day. And a dentist should examine the teeth and remove any tartar deposits regularly twice a year.

Pyorrhea is a disease of the sockets, around the roots, of the teeth. Pus oozes from the gums. The teeth loosen and fall out. It is a loathsome disease. And it is hard to cure. IT IS THE RESULT OF NEGLECTED TEETH. The only hope of cure is prompt treatment by a good dentist. Sometimes it can be cured. Sometimes it cannot. Prevention is better than cure, and far cheaper.

A fourth disorder of the teeth is one which is hidden from sight, and, therefore, often overlooked—small abscesses which usually occur at the roots of teeth that have been filled or crowned and appear to be in satisfactory condition. But sometimes apparently sound teeth which have never been decayed are found to have them. They are found by X-ray examination. Their effect upon health is very important. These small abscesses have no outside outlet for their germs and poisons so they have to throw them into the blood as it flows by. When they are thrown into the blood stream they circulate all over the body and cause diseases. The diseases which they cause depends upon which part of the body they affect. If the germs lodge in the joints and grow there, rheumatism results. In the same way heart disease and kidney disease may result. Not all rheumatism, heart and kidney disease are produced in this way, but many cases of them are cured by pulling diseased teeth or by draining the abscess in some other way,

so that the germs do not go into the blood stream.

In addition to the diseases which they produce alone, the germs from the teeth often help other germs in their destruction of the body. In hospitals for tuberculosis the teeth are examined to see if they are feeding germs into the blood and aiding the germs of tuberculosis. In hospitals for the insane they are examined to see if they are feeding poisons to the nervous system, and some insane people are greatly benefited when their teeth are corrected. In view of the fact that many cases of rheumatism, heart disease and kidney disease improve after the treatment of abscessed teeth, which may not ache at all, the teeth of such patients should be examined with the X-ray.

If we follow nature in the use of our bodies we usually do the right thing. She develops the organs which we need as we use them. A blacksmith has strong arms because he uses them. Our teeth would be better if we used them more. If the child is fed on patented, pre-digested foods, which relieve him of all the work of chewing, until after his teeth are grown, and if he then bites off his food and swallows it whole, what use do we have for teeth, and why should nature keep them up? If we chewed all our food well and gave our teeth plenty of useful exercise they would be sounder, stronger teeth. By chewing our food better it is digested and absorbed better and our teeth, along with the rest of the body, are better nourished and they develop into sounder teeth. Our teeth were given us for the sole purpose of chewing food, and the more we exercise them in chewing the bet-

ter teeth they will be and the better fed we will be on the same amount of food.

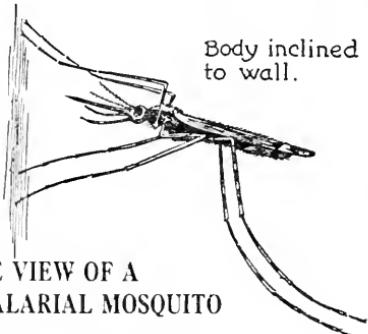
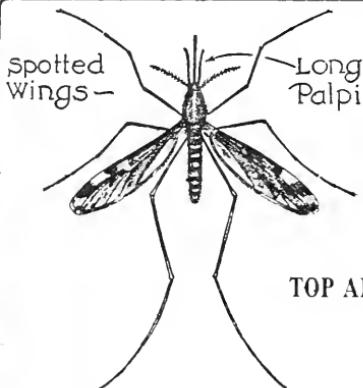
When we clean the teeth and have them repaired we are not taking the place of nature. We are only aiding her. A clean tooth never decays. To clean the teeth properly requires the use of a tooth-brush and tooth powder or paste, a tooth-pick to remove food particles from between the teeth, and dental floss or coarse silk thread where tooth-picks will not remove the particles. Almost any of the prepared tooth powders, pastes or dental creams now on the market will do. The best tooth-brush has irregular or tufted bristles. Ordinarily a medium stiff bristle is suitable for adults and a soft bristle for children. It would be well to brush the teeth before going to bed, before breakfast, and after each meal. But for many people it is not convenient to brush them more than twice a day. This, at least, should be done. After each meal, food particles should be removed from between the teeth with a tooth-pick or a piece of dental floss, and the teeth rinsed by forcing a mouthful of water through them. Then the teeth should be kept in good repair by visiting a good dentist every six months. By having the teeth examined, cleaned, and any slight decay remedied, the teeth and mouth will at all times be kept in excellent condition.

As soon as your child is old enough to eat solid food make him chew his own food, and teach him to chew it well. Teach him to brush his teeth regularly and to have his dentist keep them in good condition. With a good set of teeth and a good digestion one of his big problems of health is solved.

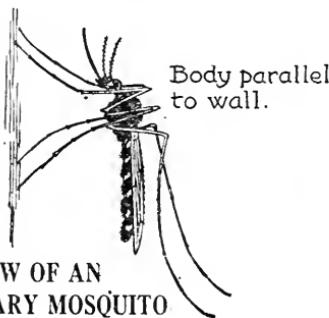
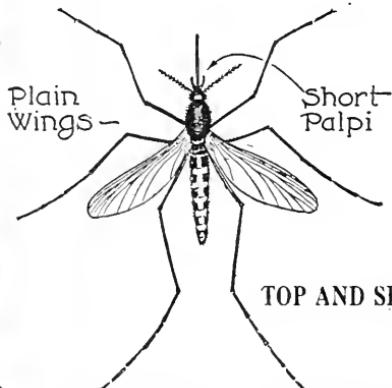


HOW TO PREVENT MALARIA (CHILLS AND FEVER)

MALARIA IS CARRIED FROM PERSONS HAVING MALARIA TO OTHERS BY THE MALARIAL MOSQUITO AND IN NO OTHER WAY.



TOP AND SIDE VIEW OF A
MALARIAL MOSQUITO



TOP AND SIDE VIEW OF AN
ORDINARY MOSQUITO

- 1- PREVENT MALARIAL MOSQUITOES BY CUTTING DOWN WEEDS AND BRUSH AND DRAINING, FILLING OR OILING WET PLACES ~ NO MOSQUITOES ~ NO MALARIA.
- 2- THOROUGHLY SCREEN EVERY DOOR AND WINDOW.
- 3- IN A MALARIAL REGION TAKE 5 GRAINS OF QUININE DAILY FROM MAY 1 UNTIL FROST.
- 4- SCREEN MOSQUITOES AWAY FROM MALARIAL VICTIMS, THEY CARRY THE DISEASE TO OTHERS.
- 5- EVERY MALARIAL PERSON SHOULD BE TREATED UNTIL COMPLETELY CURED, HALF CURED MALARIA CAUSES ILL HEALTH, GREATLY REDUCES EFFICIENCY, ENDANGERS OTHERS AND MAY DEVELOP AGAIN, AVOID PATENT MEDICINES AND CHILL TONICS.
SEE YOUR DOCTOR OR HEALTH OFFICER.

FOR FURTHER INFORMATION, WRITE TO THE

State Board of Health, Raleigh, N. C.

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The

The Health Bulletin

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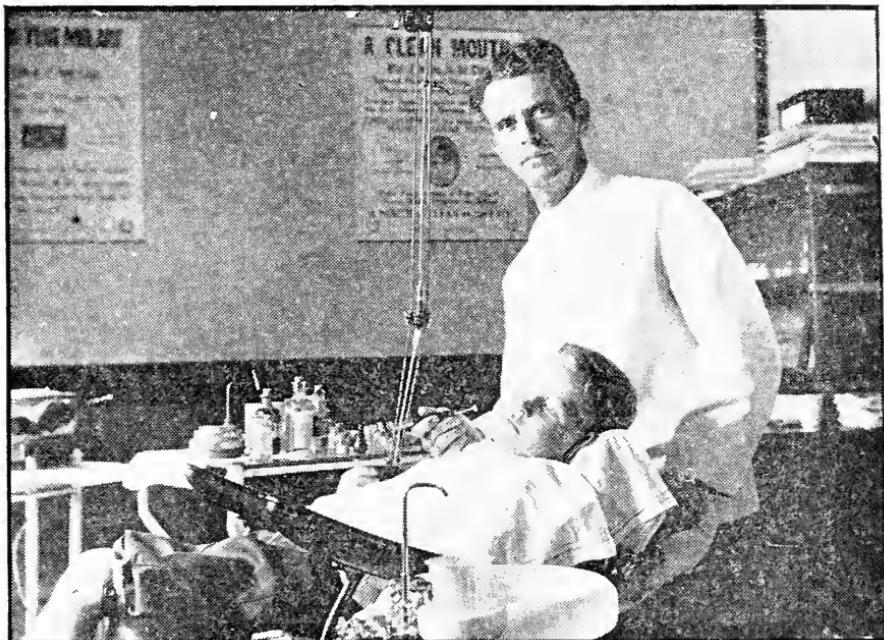
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WAKE COUNTY DENTAL CLINIC

Following demonstrations by the State Board of Health a permanent free dental clinic for the school children has been established in Raleigh by the Wake County Health Department. The clinic is in the handsome county court house. The picture shows Dr. E. A. Branch, dentist in charge, with a young patient in the chair. Similar permanent dental clinics have been established for counties of Durham and Vance, and for the cities of Winston-Salem, Charlotte, and Greensboro.

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FREE HEALTH LITERATURE

The State Board of Health has available for distribution without charge special literature on the following subjects. Ask for any that you may be interested in.

WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SPIT PLACARDS	ADENOIDS
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
TUBERCULOSIS	EYES	TYPHOID FEVER
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CARE OF THE BABY	TEETH	CONSTIPATION
FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREAL DISEASES
TUBERCULOSIS PLACARDS	MALARIA	CATARRH

FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The **Health Bulletin** is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for **The Bulletin** each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.

THE Health Bulletin



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IS YOUR CHILD READY FOR SCHOOL?

How About Eyes, Ears, Nose, Throat, Teeth?

Very shortly the schools all over the State will be opening. In cities, towns, villages, and rural districts thousands upon thousands of children will be making their way to the schoolhouse, there to receive training which very largely will influence all their after years. Some will be going to modernly constructed and equipped buildings in the cities and towns, with well-trained teachers presiding over small classes. Others will be going to some of the few remaining one-room, one-teacher schools, where it is impossible for either teacher or child to do the best work.

Regardless of the sort of school that will be attended, regardless of the sort of home from which the child goes forth, in nearly every instance there are certain things which the parents will do before the tramping of these thousands of little feet schoolward bound is again heard in the land.

First of all, there will be a replenishing of the wardrobes of the children. Perhaps at home overalls, gingham aprons, bare feet have been the rule all summer. When school opens family pride demands that the boy or girl attend in whole garments that are clean and in the prevailing mode, and in most cases their feet be encased in stockings and shoes.

Secondarily comes the question of securing the required text-books. Quite frequently this is settled only after considerable agitation and protest, for there are still fathers who will have nothing but the best tools for their work, whether on the farm

or in a trade, who pretend they cannot see the use of their children being required to have modern textbooks. Yet in the end these are furnished.

So the children from the usual family start in the school term equipped with clothes and books, and pens and pencils and tablets of paper. If the suggestion were made to father or mother that the most important thing in connection with the child's entering school had been totally neglected there would be a prompt and vigorous denial, expressed with more or less indignation.

Yet this is almost universally true in North Carolina. While the outward appearances are carefully looked after, needed school materials furnished, and some thought taken with regard to the child's physical comfort, it is the rare and exceptional set of parents who make sure that the child is in fit physical condition to receive the benefits of mental training offered in the school.

Stop just a moment, Mr. Father and Mrs. Mother, and take thought about your child. How about the eyes, the ears, the nose, the throat? How about the height and weight? How are the teeth? Do you know anything, really, about the condition of the child? But what has this to do with going to school? Just about everything.

Children who have defective eyes, ears, noses, throats and teeth cannot, unless they are relieved, receive and profit by public school education. To such handicapped children school work is a pain and a burden. They lag behind in their classes, sometimes repeating the same class year after year, an exasperation to the teachers and a dis-

couragement to themselves. Unless relieved and rendered fit for study, they frequently are regarded as mentally deficient, and sometimes as morally vicious. They become personally disheartened and truant, and both teacher and parent too often give up the child as a bad job.

The system of medical inspection of school children in operation during the past six years has wrought wonders in correcting defective noses and throats and repairing defective teeth among the school children. Yet the corrective work so done has in reality reached only a few. Manifestly it has been impossible to make corrections in all cases found, and equally as impossible to find all cases where defects existed. The example, however, has been set, and in a gratifyingly large number has been followed. Upon the parents rests the responsibility, one that can be discharged only by having the child carefully examined by a competent physician before the beginning of school, and any defect found promptly corrected.

Great as has been the improvement resulting from the system of school inspection, there is still one of the important defects of children about which comparatively little has been done toward correction. This is with regard to eyes which are not normal. Too many parents take it for granted that the child's eyes are all right as long as the child does not complain, and can see to read and get about. All too often irreparable damage is done before it is discovered that there is anything wrong.

On another page is a carefully prepared article on the most common causes of errors in vision and the importance of treatment, prepared by Richard H. Lewis, M.D., LL.D. It is worthy of careful reading.

MEDICAL INSPECTION OF SCHOOLS

Results Achieved Through Definite Pursuit of An Ideal

For the past eight years so much has been said and written on the

subject of medical inspection of school children by the North Carolina State Board of Health that the official most responsible for this agitation feels almost like apologizing to the public when the subject is mentioned again. On the other hand, while the story is old to the Board of Health personnel engaged in the work, it is a new one each year to the hundred thousand children coming into the first grades of the public schools in the State, and to a large per cent of their parents. It is also a story that cannot be told too many times in order to stimulate future activities to the point of surpassing each year what has been done in the previous year. In the years to come the history of this achievement will constitute an important chapter in the history and development of the State of North Carolina for the period. Therefore it is important to keep the records straight.

The one definite purpose which at all times has animated the sponsors of this movement in the State of North Carolina has been to reach the handicapped child, and to do something for him. To discover through an inspection a defective school child and to recommend to that child's parent that something be done to remove that handicap is an old, old story; but to set the machinery of a State in motion to aid the parent of that child in getting the handicap removed is an entirely different kind of a story. To discover defective children and to advise treatment; to realize that the advice could not or would not be taken in most cases; and to realize that a definite plan of action is indicated as a remedy for these conditions, is a horse of one color. To organize and execute a plan of action which is practicable and workable is another horse of an entirely different color.

The plan of action which may be called the follow-up to medical inspection of schools has been the organization and maintenance of clinics in which school children suffering from the common remediable handicaps of diseased throats and decayed teeth might have these condi-

tions remedied. In 1918, after surveys made in many counties representing various sections of the State and covering the inspection of some twenty thousand school children, definite plans were put in execution which resulted in the establishment of free dental clinics and tonsil and adenoid clubs as the logical sequence to the routine medical inspection of school children.

Results Achieved

Through the establishment of these clinics, beginning in 1918 to July 1, 1923, free dental clinics for public school children had been held in every one of the one hundred counties in North Carolina. Every section of every county in the State, from the wealthiest city community to the poorest and most sparsely settled mountain section, has been represented in these clinics. One hundred fifteen thousand seven hundred and eighty-two children have been given free dental treatment. These children came from the homes of rich and poor alike. The only requisite for treatment has been that they be public school children, and under thirteen years of age. The stimulus that has been given oral hygiene and the study of the question of teeth and their care in the State of North Carolina from Cherokee to Currituck is of inestimable value. Besides being a direct aid to these one hundred and fifteen thousand children, the work and the ideal represented behind this work has accomplished a great deal beyond the limits of the work itself.

During the same period of time tonsil and adenoid clubs have been held in seventy-six of the one hundred counties, giving children of remote sections an opportunity of having a first-class surgical operation done. A majority of these could never have had the opportunity presented in any other way. Seven thousand two hundred and one children have received the remedial operation for diseased throats in these clubs by competent specialists. Although the work, of necessity, had to be done in improvised hospitals with portable equipment, it has been

done with every precaution for safety, and by the most competent operators in the State of North Carolina. The proof of the success of this effort lies in the fact that in all this army of children throughout the whole period there was only one death, and that a result of local anesthetic in which the tonsil operation was being undertaken as a preliminary step to an operation for the removal of goiter, which was to take place later. In all these series not one child has developed fatal complications. There has never been a case of infection of the throat to follow. The direct result, besides affording this health-giving operation to more than seven thousand children in seventy-six counties of the State, a majority of whom would otherwise never have had a chance, is an illustration to the masses of the people in the State that there is such an operation. The reasons for the necessity of the operation have been demonstrated, also that when done for a child suffering from diseased tonsils and adenoids the operation promises in ninety-nine cases out of a hundred improved health and physical development, and an all round better chance in life.

THE SCHOOL LUNCH

Some Things That Are Good and Some That Are Harmful

The development of the school lunch during the past two or three years in the cities and towns of North Carolina has been remarkable. That fact proves that the lunches served by and with the consent of the school authorities are necessary and practicable. But like everything else of value, it is capable of abuse. In some towns the enterprise has been farmed out on a commercial basis, leaving the school authorities with responsibility, but without any active authority in the management. The consequence is that in some instances, at least, the children are sold food that is not only unfit for them, but food which is positively

harmful. In at least one school very near the State Capitol last year the children were sold all kinds of indigestible cakes and cookies, including even the abominable all-day suckers. To make matters worse, the charge for such essential food as milk was unreasonable and above (instead of considerably lower) than the charges in up-town cafes. To illustrate: suppose the average school pupil is offered a choice of a half pint glass of milk at 6c or a "hunk" of bakery cake at 5c, his choice is of course the cake. The commercial manager of the school lunch quickly learns that it is cheaper to fill a sandwich with some proprietary condiment like mustard than it is to fill it with plain fresh butter, and naturally the child prefers it, too. In some instances it has come to our attention that even "Wieners" with mustard dressing have been sold to children who buy the stuff like the proverbial hot cakes. A greasy, leathery Wiener covered with mustard oil is probably the worst and most indigestible morsel of so-called food ever concocted by civilized man, even to punish the stomachs of adults; but to allow children to purchase such stuff at a school food room under the supervision of educators is indefensible.

It is far more excusable for a child to be allowed to select his own diet at home than it is for him to do so at school. The purpose of the school is to teach a child to form correct habits of thought and action. The parents often do not know how to teach the child concerning these things.

For the purpose of offering helpful suggestions to those who are responsible for the selection of menus for public school cafeterias, we are here publishing a list of foods which should never be served, followed by a much longer list of suitable foods.

Items Which Should Never Be Allowed

Wieners.

Ham sandwiches.

Mustard or other condiments.

Cakes, pastries, doughnuts.

Candy, coffee, tea.

Suitable Foods

Milk.

Butter.

Good, rich vegetable soup (not dish-water kind).

Broths, such as beef or chicken.
Fruit of any description, except bananas.

Apples especially may be served, raw, baked, stewed.

Fresh boiled eggs.

Roast beef, chicken, mutton.

Fish, boiled or broiled (not fried).

Bread, whole wheat, stale, rye, corn (muffins).

Toast, dry, buttered, milk.

Plain white crackers.

Oatmeal with sugar, with or without cream.

Cream of wheat, rice.

Potato, baked or mashed, baked sweet potato.

Vegetables, peas, beans, spinach, asparagus, celery, lettuce, carrots.

Sugar cakes (old-fashioned tea cakes).
Apple-juice sauce, gelatines, ice-cream.

The above list may be greatly extended, but the items enumerated should afford a wide enough variety. Some school dietitians may allow boiled ham sandwiches. It would seem, however, that, as the average school child hurries away from home in the morning after bolting a few mouthfuls of breakfast, and as the time for school lunch is limited, and considerable time should be devoted to open-air exercise, the lunch should be composed entirely of light, easily digestible food. The heavier articles of meats and such foods, allowable even for older children, should be left for the main meal at home after the school day is over.

FREEING ORANGE FROM FEVER

Dr. Charles S. Mangum, now touring Alamance, is to move over into Orange County Monday, August 13, to give free anti-typhoid and anti-diphtheria treatments to everybody in the county who wants to take them. He is doing the work by arrangement with the State Board of Health. Most of the counties of the State have already taken advantage of the treatments, and as a re-

sult the number of deaths from typhoid fever in North Carolina has gone down from 839 to 298 in eight years. Alamance County, where the third campaign is now being conducted, offers a good example. In 1913 there were 39 cases of typhoid and 8 deaths in Burlington alone; in 1922 in the entire county of Alamance there were only 11 cases, and no deaths. In Orange, where no campaign had been carried on, there were 53 cases of typhoid last year, and Orange has less than half the population of Alamance. — The Chapel Hill Weekly.

RAISING STANDARDS OF DENTAL EDUCATION

The course of study for a degree in dentistry in the United States will be lengthened from four years to five. All the dental schools will be brought to a higher standard of excellence, especially in medico-dental subjects. Hereafter, in the preservation of the general health of the individual, there will be closer co-operation between the physician and the dentist. These results will follow a survey and classification of dental schools recently completed by the Dental Educational Council of America.

Great changes are taking place in dental education owing to recent discoveries of the intimate connection between the condition of the teeth and general health. It has been clearly shown that decayed and abscessed teeth often cause heart disease, "rheumatism," neuritis, eczema, mental disorders and other serious diseases. So important has the relation between sound teeth and good health become that it is necessary now to raise educational standards in order to prepare students properly to meet the public needs and to maintain the position of world-wide supremacy that American dentistry has always held.

The rapid forward trend in dental education is shown by the fact that many privately owned schools have become recently organic parts of universities. There is no doubt that the few remaining schools of this type

will take the same course in the near future.

A prescribed minimum standard for dental schools is fixed by the Council, and all existing institutions have been classified in accordance with this standard. Two classes, "A" and "B," are allowed for schools whose curriculum, teaching staff, equipment and methods are considered high enough to justify the expectation that their graduates can pass the examinations prescribed by State Dental Examining Boards and will become effective registered dentists. Schools placed in class "C" by the Council are believed to need such thorough reorganization that the Council will recommend to the various State Dental Examining Boards that their graduates be barred from registration pending action by the officials of the schools so classified to bring their institutions up to the minimum standard set by the Educational Council.

PHYSIOLOGIC CLINKERS

One reason why the professional study of science in general, and medicine in particular, has failed to win public applause and gather popular support in larger measure than it does at present lies in the distortions and misrepresentations to which this department of learning has all too often been subjected. The quack and the imposter make no sincere pretense of adhering strictly to the known in heralding their claims; the pseudo-scientist usually dresses his propaganda in a variety of raiment that may include ignorance, erroneous belief and mere conjecture. All too often, even the reputed scientist is found supporting a doctrine that is dangerously near uncertainty of demonstration, or rests at best on the basis of inadequate investigation. Much of the scientific teaching of today is permeated with a cock-sureness that is unwarranted by the meager facts of experience or experiment.

When the out-and-out fraud is perpetrated we do not hesitate to assail the perpetrator. The Propaganda for Reform supported by the

American Medical Association is frank and unrelenting in its attacks on such persons as nostrum venders and their ilk. Even the public can usually appreciate the propriety and benefit of these efforts to eradicate a harmful evil. Criticisms of the food faker, the health faddist and similar types of pseudoscientists usually find a less sympathetic hearing, possibly because the man in the street is unable to distinguish between the language of these uncritical if not unscrupulous propagandists and that of the honest devotee of science. As for the unweighed or unguarded statements of the latter, they are often received as the dictum of "authority." Who among us can always discriminate between the off-hand remark and the well-reasoned belief of an "expert" in science?

The time has come when those interested in the dignity of science should protest, wherever it seems desirable, against any semblance of finality or any assumption of authority in unwarranted statements of those who trade on scientific investigations. When we hear the enthusiastic advertiser say that "fish is a brain food" or that this suction device will "grow hair" on a bald head or that electric belt will prevent an attack of rheumatism, let us soundly berate him. Let us not overlook the more subtle forms of questionable information such as recently appeared in the alleged remarks of a president of one of the prosperous medical cults. Attacking what he

termed "food drunkards," he was quoted widely as saying:

"The American diet of bread and meat and potatoes, topped off with sweets, is the cause of more spinal curvature and joint deformation than any other one thing. If Congress would place a tax of a dollar a pound on sugar, the national health would show an immediate improvement. As for bread and meat and potatoes, they are too heavy and concentrated, and form clinkers in the system."

It is, of course, true that bread and meat are "concentrated foods" when compared with fruits and vegetables in general. However, few foods in the entire dietary of man show as high a coefficient of digestibility as do the items which the "drugless" food "expert" has so glibly condemned. What, then, is meant by "clinkers in the system" in the case of these foods? Surely not indigestible residues. Studies in nutrition belie such an answer. Or are there perhaps "clinkers" in the metabolism—some half oxidized fragment of an amino-acid or glucose? Scientific reasoning fails here when the unmeaning analogy of the cellar furnace is used to conjure with before an audience that understands the fire-box of iron and clay only. Bread, the backbone of our national dietary, produces physiologic clinkers? Bosh! And yet, a little physiologic knowledge is a dangerous thing—in the hands of a clinker expert.—Journal of American Medical Association.

WEAK EYES

THEIR MOST COMMON CAUSES AND THE IMPORTANCE OF
THEIR TREATMENT

By Richard H. Lewis, M.D., LL.D.

Member of the North Carolina State Board of Health

By weak eyes we do not mean eyes that are weak from actual disease, as, for example, the common sore eyes, which weakness is temporary and passes off when the disease gets well, but those eyes which, while perfectly healthy, are not properly

shaped to perform with ease the work—for it is actual work, muscular effort—required in the act of seeing distinctly without extra effort or strain. These irregularities in shape cause what is known technically as "errors in refraction."

HOW WE SEE

As we are apt to take a more intelligent interest if we have some idea of "how the thing works," I will try to explain as simply and clearly as possible the working of the eye in the act of seeing. This explanation hinges on the behavior of light in relation to the eye. We cannot see in the dark.

A convex lens, usually of glass, as we see it, is a round flattish body thicker in the middle than on its edge. The effect of this lens on the rays of light falling upon its surface and passing through it is to bend them toward a line running through the center of the lens at right angles to its surface and bring them all together at a point on that line which is known as the focus of the lens. The Latin word, "focus," means a fireplace around which the members of the family are drawn together. The distance of the focus from the lens depends upon the curve of its surface. The more sharply curved it is, the thicker it is in the middle; the shorter the focus, the closer it is to the lens. The focus, what is known as the "principal focus," is the point at which rays of light from a distant object—twenty feet or more away, which rays travel in a bundle parallel to one another—meet; but when the object is brought close to the lens the rays diverge. They are in a cone-shaped bundle, the apex or point of which is in the object, while the base or wide end of the cone is on the lens, so that, as the lens has a fixed bending power on the rays, they must come together farther back than the principal focus. The rays of light reflected from the infinite number of points in an object are brought together in corresponding points at the focus in the same relationship to one another as are the points in the object, and we have made for us in this way a very small image or picture of the object on the screen used to catch the rays. If this screen is exactly at the focus the picture will be clear and distinct; but if it is too far or too near to the lens the picture will be blurred and indistinct.

You have no doubt noticed at the moving-picture show that often when the picture first shows on the screen it is blurred, which means that the screen is too near or too far from the lens in the machine. It is out of focus, but in a moment the operator moves the lens to its proper distance and the picture comes out sharp and clear. Or you can take grandpa's specs, which are convex lenses, and, closing all the windows but one, hold them about a foot from the white wall directly opposite, moving them slowly nearer and farther, until you strike the exact focal distance, when you will see on the wall a clear picture of the window and the trees outside, turned upside down.

In a word, a convex lens will make a clear picture on a screen placed to catch the light exactly at its focus. The distance from the lens of this focus depends upon the strength of the lens, the sharpness of its curves, its thickness in the middle in proportion to its width—the stronger the lens the shorter its focal distance. The nearer the object is to the lens the farther back is the focus for that object.

Now let us apply these principles to the eye.

In the front part of the eye, just behind the blue, gray, or brown curtain, the iris, with its round window in the center, the pupil, through which light enters the eye, there hangs suspended in a sac or bag a very strong convex lens. Surrounding the edge of this lens is a very small circular muscle which adjusts the lens to different distances, known on that account as the muscle of accommodation.

Lining the inner surface of the wall of the eyeball, the outside layer of this wall being the "white of the eye," there is an extremely delicate nervous membrane called the retina, which is connected with the brain by the optic nerve.

In the normal or correct eye this retinal screen is exactly at the principal focus of the lens, and, therefore, clear pictures of distant objects are made on the retina without any effort. But when the object is

brought close to the eye, the focus is farther off, behind the retina, and the picture is blurred. The focal distance must be shortened up to the retinal screen to make it distinct. As the distance between the lens and the retina cannot be changed, as it

can be and is in the moving pictures as referred to above, the only way to shorten the focus is to increase the strength of the lens. And this is just what is done by the action of the muscle of accommodation. The strength of this muscle in the normal



State Board of Health School Nurse making the Snellen test for defective vision of a school girl's eyes. This photograph was taken in Person County.

State Board of Health School Nurse at work in Person County. She is here shown engaged in making an inspection of a child's throat, following the previous inspection by the boy's teacher. If the parents, the teacher, and the nurse think an operation for removal of tonsils and adenoids is necessary, the question will be left to a physician and the surgeon who would operate for final decision.



or correct eye is sufficient to adjust with ease to as near a point as there is need for up to between forty and fifty years of age. At this period of life the lens has lost so much of its elasticity, has become so stiff and firm, that the requisite amount of convexity cannot be brought about by the muscle of accommodation, and so this convexity must be added to artificially by putting another convex lens in the form of spectacles before the eye. This is called old sight, or presbyopia, technically.

ERRORS IN REFRACTION

Having seen how the normal eye works, we will now consider the departures from the normal, known to the oculist as the "errors in refraction," of which there are three: far-sight or hyperopia, near-sight or myopia, and astigmatism.

FAR-SIGHT OR HYPEROPIA

The error in the far-sighted eye is that it is too short from before backward, and in consequence the retinal screen is too close to the lens, the focus is behind it, and so more effort on the part of the muscle of accommodation is required to bring it up to the retina—the little muscle is strained. It behaves under the strain exactly like any other muscle of the body that is over-worked. If you will hold out at arm's length even a very light weight, or merely the arm, you will find that in a very short time the arm begins to ache, then to ache more and tremble, until finally the pain becomes unbearable and you are compelled to drop the arm and give up entirely. Now, the sensations are just the same in the overstrained far-sighted eye. First, the eyes begin to burn and sting and ache, then the letters dance or tremble, and finally they all run together just as if the page had been wiped with a wet sponge. The muscle of accommodation is tired out and gives up. If you want a demonstration of these symptoms of overstrain in your own person, hold your book or paper at the nearest point at which you can see the letters distinctly and read continuously at that

distance, and you will soon experience them. The correction of this error is accomplished by adding to the convexity of the lens through convex glasses of just sufficient strength to even up things—just as you have to do old sight.

NEAR-SIGHT OR MYOPIA

Near-sightedness, or myopia, is just the opposite of far-sightedness, the eyeball being too long from before backward, so that the retina is too far from the lens, and the focus is in front of it. You will remember that the nearer an object is to a lens, the farther behind it is the focus; that when the object, usually print, is brought near enough to the eye the focus is set back to the retina and its image becomes clear and distinct. It will probably interest you to know that a near-sighted eye, optically, is just the same as a normal eye with a convex lens added to it. So you can tell exactly how things look to the near-sighted by putting on the spectacles of some old person and looking at distant objects. As convex glasses are magnifying glasses, you can understand the fact that the near-sighted eye can see smaller objects and read finer print if held close enough than either the far-sighted or the normal eye. Unfortunately, there is no power in the eye itself to correct this error, as there is in far-sightedness, although under a strain, and it can only be done artificially by putting on a concave glass which neutralizes in part the convex lens in the eye, weakens it, and therefore sets back the focus to the retina, which, to repeat, is in the near-sighted or long eye too far from the lens. As the muscle of accommodation can only shorten the focus, which would increase or aggravate the near-sightedness, there is less strain upon this muscle than in the normal eye; but there is a strain upon a different set of muscles. Attached to the outside of the eyeball are four straight muscles, originating at the bottom of the orbit or eye-socket and attached to the ball near the front, which move the eyes up, down, in, and out. When an object is brought close to the

eyes they must be turned in so that both eyes can be directed to the object, and the nearer the object is, the more the eyes must be turned in and the greater the strain upon these muscles of convergence, as they are called. The strain on these muscles produces the same symptoms as the strain on the muscle of accommodation that adjusts the lens in the eye mentioned above in that connection—burning, stinging, itching, aching, etc. But this form of strain is more dangerous to the integrity of the eye than the accommodation strain, and for this reason: When the muscle on the inner side pulls the ball in, it puts its antagonist, the one opposite on the outside that pulls the ball out, upon the stretch, and as it runs over the curve of the globe to reach its attachment near the front you can see how it must press upon the globe—the eyes are squeezed. As a result of this pressure the eyeball is stretched and gradually yields at its weakest point at the back, the most vital part, where the picture of the object we are looking straight at is taken; and the more it is stretched the thinner and weaker it gets, the longer the eye and the greater the error becomes. If carried too far, this excites positive disease, which sometimes results in complete and hopeless blindness. So that, contrary to the popular impression, the near-sighted eye is really the weak eye and should always receive expert attention. Improperly fitted glasses in these cases are dangerous.

ASTIGMATISM

The third error in refraction, and the most common and troublesome of them all, is astigmatism. Many seem to think that astigmatism is a difference between the two eyes. It is not so at all; the two eyes as a team working together are not concerned in it. The essential feature of astigmatism, however, is summed up in the word difference; but it is a difference in focus for lines at right angles in each individual eye. In nearly all cases this is due to the fact that the cornea or watch-crystal looking structure in front of the blue

or brown iris, which is also a convex lens that reinforces the crystalline lens behind the iris which can be changed in shape and adjusted, as has been said so many times before, is not true in its curves; it is not the segment of a perfect sphere, but is shaped like the bowl of a spoon, which is more sharply curved from side to side than from end to end, so that the focus one way is shorter than it is at right angles to that way. And this cannot be corrected by the eye itself, for whenever the muscle of accommodation adjusts for lines running up and down, say, those running crosswise are out of focus, and when it changes to adjust for the horizontal the vertical lines are thrown out of focus. Astigmatism is a fixed error, always in the way both for near and distant vision, and the constant futile struggle to adjust it sets up so much irritation that the symptoms of eye-strain mentioned above are more constantly present and usually more annoying than in the other errors.

WANT OF BALANCE IN THE EXTERNAL OCULAR MUSCLES, OR HETEROPHASIA

There is another condition of the eyes which, while not an error in refraction, involves muscular strain and produces the same symptoms as those produced in the errors. This is a result of a want of balance in the outside muscles which move the eyes always together in different directions—one muscle is a little weaker than its antagonist on the opposite side, and in consequence there is a tendency of the eye to turn towards the stronger muscle and get out of line, which would cause double vision. As there is nothing the eyes abhor so much as double vision, the weak muscle makes an extra effort and preserves the balance, but at the cost of strain and its consequences.

GENERAL SYMPTOMS OF EYE-STRAIN

In addition to the ordinary burning, stinging, itching, gritty feeling, watering and aching of the eyes themselves, with frequent blurring

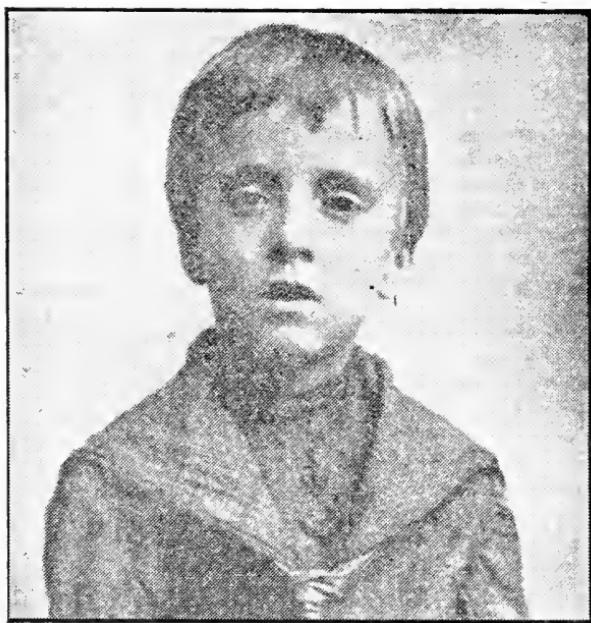
of vision, these various errors I have enumerated cause other troubles apparently not connected with the eyes, such as headache, usually located in the forehead, through the temples, in the back of the head and neck, running down sometimes as far as between the shoulder blades and occasionally extending to the shoulders, varying in intensity from only a heavy feeling in the forehead to the most violent sick headache; nervous indigestion with lack of appetite; various forms of nervousness, including St. Vitus' dance, and attacks closely resembling those of epilepsy and various other curious manifestations. All the errors cause the above-named symptoms, with astigmatism having to its credit 60 per cent of all headaches, and a combination of astigmatism with a want of balance in the external muscles being responsible for the most violent forms, as a rule. Leaving out the serious ailments of the body which threaten life, I feel safe in saying that nothing has done so much for the relief, comfort, and efficiency of mankind in the domain of medicine as the accurate correction by glasses of these ocular errors.

HOW TO ASCERTAIN THE EXISTENCE OF ERRORS IN REFRACTION

By an actual test of the sight by means of test-types, which are made on scientific principles, and with which you may be familiar as they are now used, I am glad to say, in so many of our schools—always where there is a medical inspection provided. These test letters, beginning with the largest one at the top of the card, are labeled 200 feet, 100, 70, 50, 40, 30, 20, 15, and 10. This means that these letters at their respective distances make the same sized picture on the retina, this picture being about as small as the average normal eye can make out. The usual method is to seat the person to be tested 20 feet from the letters and test each eye separately by closing the other. If he can call

correctly the letters under No. 20 at 20 feet, his vision is $\frac{20}{20} = 1$, which is standard vision; but if he can only make out No. 40, say, which is twice 20 as big as No. 20, his sight is $\frac{20}{40}$ or one-half the standard; and if the best he can do is No. 200, his vision is only one-tenth of what it ought to be. When this test is made of the children at school, the medical inspector or the teacher sends a card to the parents of those found defective, advising an examination of the eyes by a specialist. And this should always be done when possible, especially when both eyes are below par. But another and more universally applicable way of ascertaining the existence of these errors is by the presence of the symptoms of eye-strain mentioned above. In a great many cases of very slight astigmatism the acuteness of vision is not only fully 20 up to the standard of $\frac{20}{20}$, but above 20

it, or $\frac{20}{15}$, while the symptoms of eye-strain, often including headache, are very pronounced. I wish to impress this fact particularly upon parents of children at school. Do not dismiss your child's eyes from your mind simply because his sight is reported good by the test-type method: but if he complains of his eyes or of headache he should be examined, and always, when practicable, by a reputable specialist. This is an important matter, not only from the point of view of the eyes alone and the handicap in getting his education, but also on account of the effect on his character. The eye trouble gives him an excuse to neglect his lessons, and the habit of shirking his duty may be formed and last him through life. Most of "us boys" remember how glad we used to be of any excuse to get out of an unpleasant duty. It is especially important that all near-sighted children should be fitted with very carefully adjusted glasses in order not only to prevent the necessity of holding the book too



Case of nasal obstruction from adenoids,
showing characteristic dull facial expression.

(Courtesy Dr. B. C. Gile)



Same case two years after removal of adenoids
(Courtesy Dr. B. C. Gile)

close, which is so dangerous in their cases, but to enable them to obtain an accurate perception of the outside world, which holds so large a place in the unconscious education obtained through the eyes.

CONCLUSION

From what has been said above, perhaps at tiresome length, it appears that too near an approximation of the object, usually books, will strain both muscles of accommodation and of convergence even in the normal eye. Therefore, it follows

that anything which causes this should be avoided. The most common cause is insufficient light. Nothing is worse on the eyes than to read or write by too dim a light; very fine or bad print; a disproportion in the height of seat and desk, too low a seat or too high a desk, etc.

Finally, every child, particularly he who suffers in consequence of the errors described, should be made comfortable and given a fair chance not only in school but in the race of life.

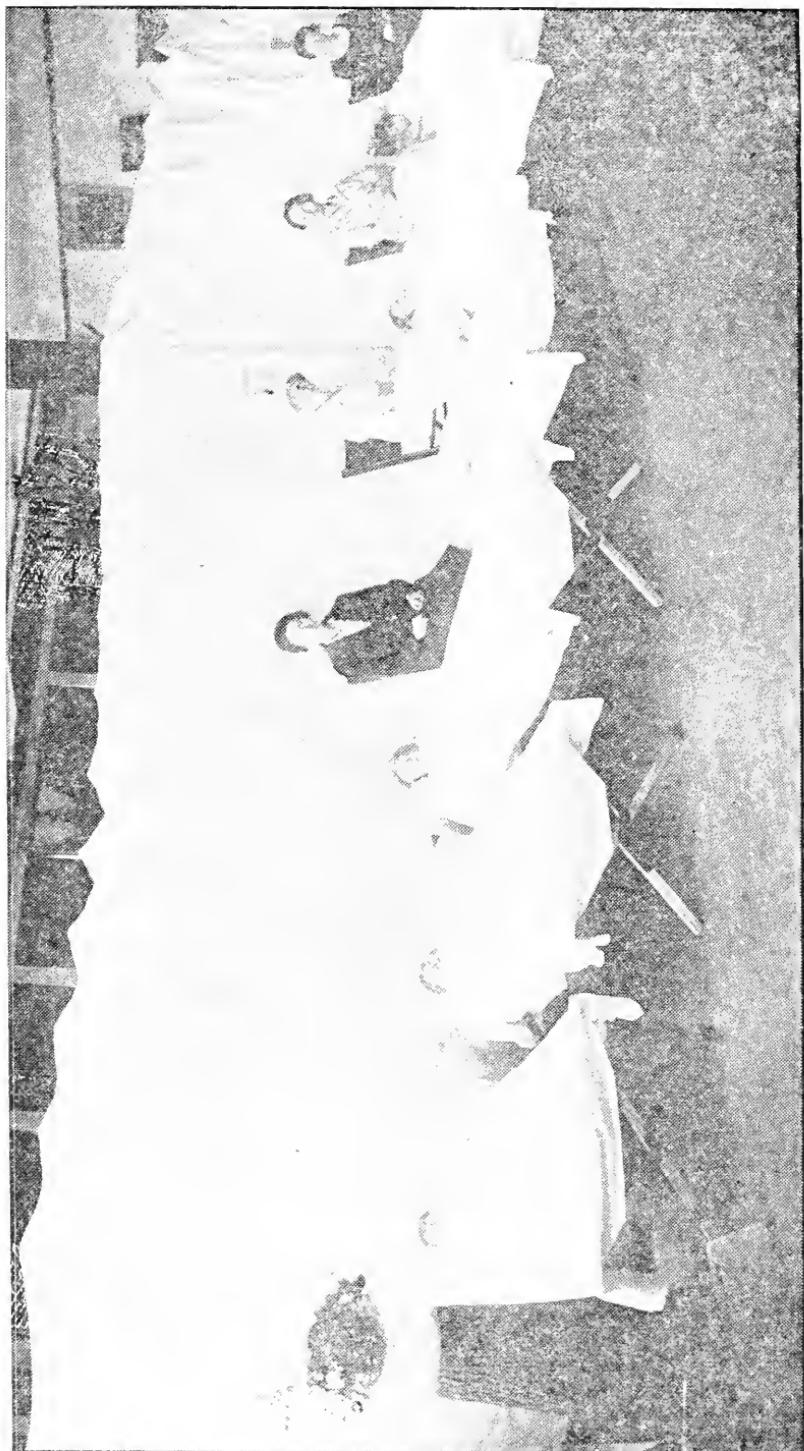
DISEASED TONSILS AND ADENOIDS

WHAT THEY ARE, THE TROUBLE THEY CAUSE, AND HOW TO TREAT THEM

LOCATION AND DESCRIPTION

In this article the word "tonsils" is limited to two structures, one on each side of the throat, which physicians refer to as the "faucial tonsils"; and the word "adenoids" to the enlarged or diseased glands in the upper back part of the throat, above and behind the opening of the nose into the mouth. When a physician tells the parents of a child that it has "adenoids," he means that the little glands in the back part of the child's throat are abnormally enlarged and diseased. The largest adenoid, which means literally "like a gland," is present in a child's throat at birth, and throughout childhood. In fact it is normal for this gland to grow and become larger up to about the age of seven. It then remains about the same size for a few years, and by twenty years of age practically disappears. It is only when this gland becomes abnormally large, or becomes diseased, that it causes trouble, and the doctor advises an operation for "adenoids." The tonsils are also always present at birth, and in very early childhood are about the size of the adenoid, but later are much larger. The tonsils, unlike the adenoids, do not disappear as the child grows older, but remain through life, gradually con-

tracting and becoming smaller unless diseased. Thus tonsils frequently trouble people over fifty years old, and when diseased should be removed even that late in life. Adenoids when diseased may vary in size from a small pea to a mass of tissue as large as a walnut. The tonsils when diseased may become as large as a Japanese plum. Sometimes when simply abnormally enlarged they stand out plainly, almost closing the opening to the throat in the back part of the mouth. In other cases, and often when badly diseased, they are "impacted," "imbedded," or "injected," that is, submerged into the tissues of the surrounding structures of the throat, so as to become hardly visible on a casual simple inspection. There are numerous crypts or pockets in the body of the tonsils which have outlets toward the throat surface. These crypts frequently, in diseased conditions of the tonsils, become dilated in places and contain a considerable amount of secretion. Thus the mere size of the tonsils is nothing like so important as whether or not they are diseased. Tonsils are more liable to become diseased than adenoids, and as they do not disappear like adenoids they may remain, if diseased, a source of trouble throughout life.



CHILDREN RECOVERING FROM EFFECTS OF OPERATION
Showing temporary emergency hospital set up in fraternal lodge room at Elizabeth City. The children are put to bed immediately following the operation and required to spend the night in the hospital under the careful watchfulness of nurses and supervision of clinic physician.

Poisonous products from diseased tonsils may get into the lymph channels and be carried to the glands of the neck, causing the swelling often seen in children. One of the surest symptoms of unhealthy tonsils is shown by repeated attacks of tonsilitis. Should these attacks result in pus formation, swelling and pain, in which the abscess either breaks or has to be opened, allowing the pus to escape, the tonsils should be removed. Such tonsils are a menace to health. The trouble is deep-seated, and is not amenable to any other than surgical treatment. Sprays, gargles, washes and external applications do very little good. The trouble is deep-seated, and the only satisfactory and effective treatment is removal by a competent throat surgeon.

THE FUNCTION OR USE OF TONSILS AND ADENOIDS

The medical profession cannot definitely explain the function or use of tonsils and adenoids, and consequently there is a difference of opinion. At the present time a majority of throat specialists do not hesitate to say that tonsillar and adenoid tissue have no function or use whatever. On the other hand, many medical authors say that the tonsillar organs are not "remnants" like the appendix, which might have been useful to our remote ancestors, but are definite structures, and probably serve a useful purpose in childhood. This fact, however, should be definitely known, that when diseased, these structures are not only useless but are a danger and a constant menace to the individual, and so should be removed by surgical operation.

SERIOUS DISEASES RESULTING FROM DISEASED TONSILS AND ADENOIDS

The tonsillar and adenoid structures, situated as they are at the very gateway to both the respiratory and digestive system, when affected by disease become at once a distributing point for germs to infect, through the blood stream and lymphatic glands, every tissue of the

body. They are often responsible for joint diseases like arthritis, muscular diseases like myalgia or so-called rheumatism, for chronic middle ear disease, many of the serious forms of heart disease, acute and chronic kidney diseases, and the direct cause of some serious eye troubles. They impair the digestive functions, and predispose to tuberculosis, as well as to frequent attacks of coryza (common "cold"), bronchitis, pneumonia, diphtheria, scarlet fever, and other contagious diseases.

MECHANICAL EFFECT OF ADENOIDS, ESPECIALLY ON NORMAL FUNCTION OF NOSE

Normally the air is taken in through the nose with the mouth closed. The nose is a very irregular, crooked canal having a large amount of warm, moist, mucous-covered surface exposed to the incoming air. By passing over this surface, the air is warmed and much of the dust, dirt, and germs in the air is filtered out on this sticky, mucous-covered wall, so that the air entering the lungs is warmer and purer than it would be if breathed in through the open mouth. It can be readily seen that if the adenoid growth in the back of the throat enlarges, and grows over or into the back opening of the nose, it interferes with breathing through the nose and forces the child to breathe through the mouth. A child who habitually breathes through the mouth becomes what is known as a "mouth-breather." Such a child has an altered voice. Because the upper back part of the throat where adenoids grow becomes more or less filled up with abnormally large and diseased adenoids, and the voice loses a particular quality called "resonance." The speech is stuffy; the child in pronouncing "teeth" says "teef"; in pronouncing "song" says "sogg"; in pronouncing "common" says "cobbed," and in pronouncing "nose" says "dose." Instead of saying "spring is coming" the child says "sprig is cobbig."

In this connection the question is often asked if operation for removal

of tonsils and adenoids will not destroy the voice, or at least if it will not impair the quality to such an extent as to prevent the patient from succeeding as a singer. The answer is that if the operation is done early and by a competent throat specialist, one who is careful to preserve intact without damage the faucial pillars and all surrounding structures, no harm will be done, and the quality of the voice will always be improved after operation, in cases of chronically diseased tonsils and adenoids.

other body tissues. The other two important foods, of course, are water and solids. The effect on a growing child of an insufficient supply of air is equally as grave as a lack of sufficient solid food. In its effort to get sufficient air and to overcome the mechanical difficulties, a child suffering with diseased tonsils and adenoids develops a peculiar facial expression. With the back part of the nose obstructed, partially or completely, and the mouth used as the breathing tube, the roof of the



EARLY MORNING IN CLINIC HOSPITAL

Taken at 8:30 a. m., with twenty-five children in bed ready for tonsil operation. They are amusing themselves with books, ball, and mechanical toy being worked by a nurse. The little six-year-old in cot by nurse sitting is absorbed with pencil and scratch tablet. Parents are by the cots.

HOW DISEASED TONSILS AND ADENOIDS AFFECT PHYSICAL DEVELOPMENT OF CHILDREN

In addition to causing children to become mouth-breathers, and to the effect on the voice, as well as predisposing to many diseases as described in the foregoing paragraph, diseased tonsils and adenoids are responsible for many other conditions. Forced mouth breathing causes an insufficient amount of air or oxygen, one of the three important foods of the body, to reach the lungs and

mouth slowly bulges upward to enlarge the mouth for its additional task. The arch of the teeth thus becomes more acute, narrow and bends, causing an overlapping of the teeth and a shortening of the upper lip. The only remedy for such a condition when fully established by too long neglecting an operation is to have an expert dentist spend months in an effort, through the use of braces, to spread the arch in order to restore partially its normal shape.

The nose, on the other hand, remains undeveloped, small and nar-

row. These effects produce, after the disease has become fully established, the peculiar adenoidal expression: the open mouth, the overlapping teeth, the short upper lip, the narrow, small nose, and the high-arched eyebrows. Sleeping is so much interfered with that snoring is pronounced and the child is restless and wakeful, subject to bad dreams, and so does not get the necessary amount of sound sleep that a normal child requires for proper growth and development. The delicate membranes lining the nose and the tonsil and adenoid tissue all being in a state of chronic inflammation, the child becomes more susceptible to the class of infections commonly termed "colds." As a result, both sense of smell and taste are badly impaired. This condition naturally has the effect of destroying the ability to enjoy food by tasting it, with the consequence that the child soon develops a morbid appetite and fails to consume the quantity of food of the quality essential to normal growth and development.

Finally, one of the most serious effects of a diseased throat is the interference with normal hearing. This condition may produce varying degrees of deafness, from slight impairment to almost total deafness. The most serious phase of deafness resulting from a diseased throat in childhood is that most frequently the damage is done before discovery, and generally the patient has reached the age of maturity before the chronic middle ear disease resulting begins to impair the hearing. The condition grows progressively worse and is incurable. An operation for removal of tonsils and adenoids in early life is the only preventive. Numerous tragic examples of handicapped lives and impaired usefulness resulting from this condition can be cited. Tonsil and adenoid tissue, if situated over one of the tubes (eustachian) opening from the middle ear into the throat, will prevent that ear from functioning normally and so the hearing becomes impaired. Sometimes deafness may be the only symptom at

first perceptible of a diseased throat. Parent, teacher, and family physician should be constantly on the alert to discover immediately the first indication of impaired hearing.

MENTAL PROGRESS IN SCHOOL AFFECTED

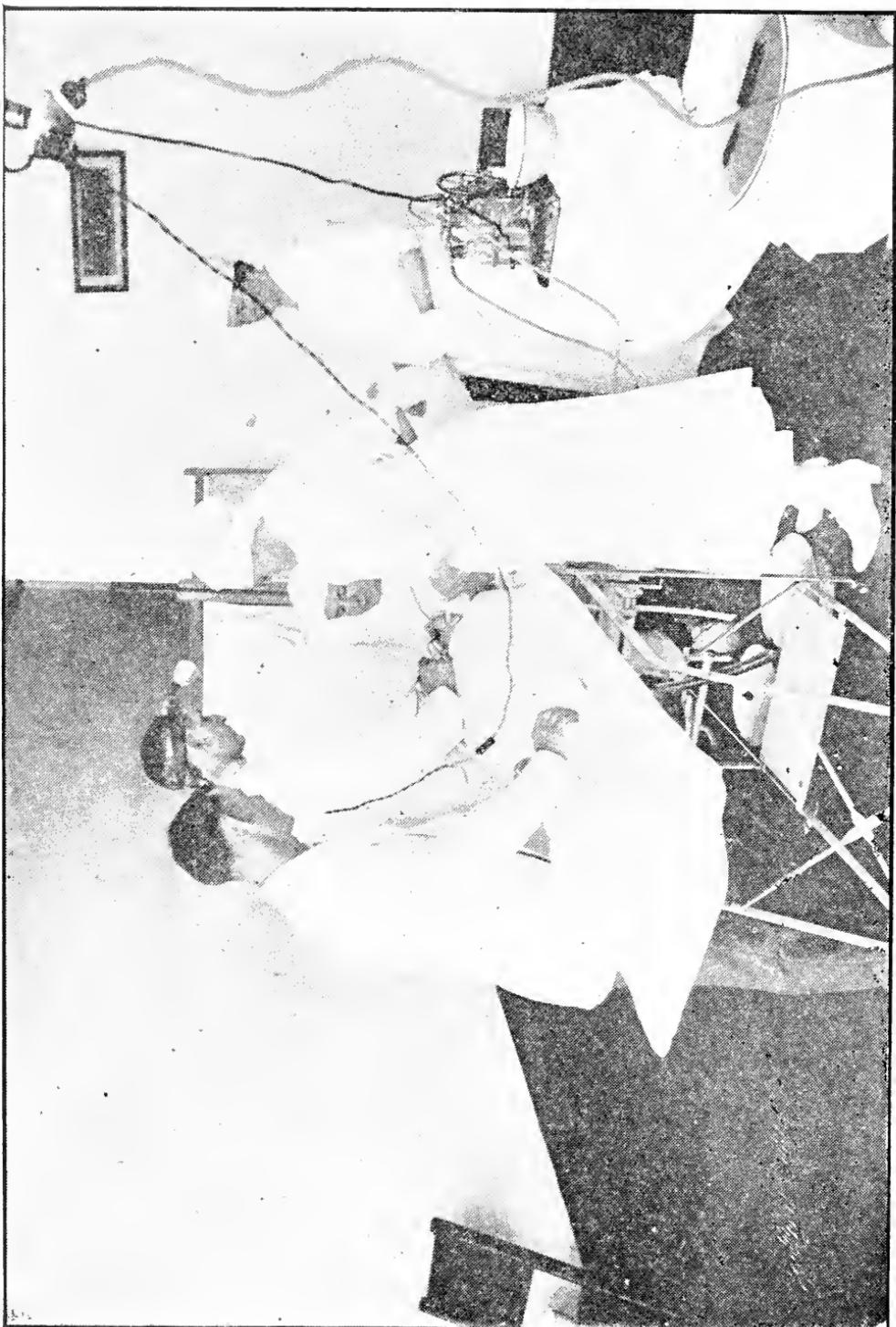
The mental capacity, and therefore school progress, is affected in several ways. A child absorbing germs and poisonous products into the system does not feel good, is not comfortable, and is restless. He cannot concentrate his mind. He must make a constant effort to inspire the air he needs. With his sleep interfered with he is drowsy during school hours. Although his hearing may be only very slightly interfered with it may be such as to cause him to fail to understand the teacher frequently. This is especially true if his desk happens to be in the back of the school room. Such a child's special susceptibility to respiratory infections causes him to lose a great deal of time from school on account of illness. So, all taken together, he does not find it possible to make the progress in school that most of his fellows make. His interest wanes, he irritates the teacher, who in turn does not realize his handicap, and so does not treat him fairly. Therefore what may be naturally a bright, gifted child, is soon turned into an unsatisfactory pupil with resulting failure as his portion, so far as success as a pupil is concerned.

REMEDY

There is only one remedy and that is a surgical operation for complete removal of diseased tonsillar and adenoid tissues, by a thoroughly competent throat surgeon. Messing with sprays, gargles, washes, electric appliances is not only useless but is a waste of valuable time. Operation should be done early in life before permanent damage is done.

AGE BEST FOR REMOVAL

A great many specialists insist that the operation may be done any time from two years up. The earlier it is done the better. Certainly from



A TONSIL OPERATION IN PROGRESS

five years to twelve years is late enough. In families having history of tuberculosis, heart disease or "rheumatism," the operation should be done just as early as it is demonstrated by a competent physician as being indicated.

IS OPERATION DANGEROUS?

Such an operation is not dangerous when done by a thoroughly capable and careful operator.

DISEASED TONSILS IN ADULTS

Physicians are frequently asked if it is worth while to remove tonsils in adults. The answer is yes. Many cases of serious diseases are relieved by removing the tonsils in adults

even after fifty years of age. And even in the case of adults past middle life, the danger of operation is certainly not as great as the danger caused by failure to remedy the condition caused by the diseased tonsils.

To Parents: The State Board of Health would advise that you observe carefully the eating, breathing and sleeping habits of your children; that you have a competent dentist examine their teeth and mouth twice a year; that you have a capable physician examine the eyes, nose, throat and ears twice a year, and upon the very first evidence of serious involvement of tonsillar or adenoid tissue, that you take the child to a first-class throat surgeon for operation.

MEDICAL HISTORY

(Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.)

MEDICAL INSPECTION OF SCHOOLS IN NORTH CAROLINA

For a few years prior to 1915, the local authorities in Raleigh and a few other towns in the State undertook medical inspection of some of the children in a limited capacity. The work, while exceedingly valuable and performed most conscientiously by the physicians attempting it, was of necessity entered into against many difficulties. In the first place, the parents, most of them mistaking the purposes, objected. The physicians were selected from general practice and could only devote an hour or two at the time and at irregular intervals to the work. Other competing practitioners looked with suspicion on the enterprise. But for the most part there was no uniformity of efforts and no well-thought-out plan of procedure; and the effort seemed to be sporadic, arising no doubt from a sense of necessity for something to be done to meet conditions existing everywhere. Nothing at all had been done for rural children except the efforts

made by some three or four whole-time health officers.

Beginning in the autumn of 1915, and continuing through 1916, the State Board of Health employed two or three physicians and undertook, through financial support from the counties, to set up some definite standards. Naturally the first requirement was to ascertain definitely the need for such work. So the work done those first two years was more in the nature of a survey. About twenty thousand school children were examined in some ten counties. The counties were representative, but the conditions found to be existing established without question the need for such service. The lack of the most elementary knowledge of sanitation and school hygiene was universal. The great percentage of children found to be suffering from decayed teeth and other common types of preventable physical defects made it imperative that the State Board of Health de-

vote all possible energies toward meeting the responsibility.

To make a long story short, the Legislature of 1917 acknowledged its responsibility and enacted a law embodying the preliminary requirements from teachers in starting the machinery to work for the child. That law at the time placed the State in an advanced position on the subject. It carried a small appropriation, while hedged about with so many contingencies made it difficult to utilize, yet it did suffice for considerable experimental work. This work covered two important phases:

First, it demonstrated the feasibility and the desirability of beginning with the teacher; and second, it proved the necessity for follow-up work, that is treatment, and that it could and should be done by some responsible agency. So out of the law of 1917, which embodied the best thought to that date, a beginning was really made, and the present law, carrying a direct appropriation, was enacted by the Legislature of 1919. This law embodied most of the 1917 law which it repealed, and eliminated most of the impractical features.

CARE OF THE TEMPORARY TEETH

By E. A. Branch, D.D.S.

Director School Dental Clinics, Wake Health Department

The permanent dental clinic maintained by the Wake County Health Department stresses the importance of properly caring for the temporary teeth. Children come to the clinic as young as two years of age. Mothers are urged to come with the children of this age in order that the necessity of care for the first teeth may be discussed with them. A child of two years has all, or nearly all, of the temporary teeth in the mouth. Naturally both mother and dentist will hope that these teeth have hard enamel caps on them. These enamel caps are furnished by the right diet, good health, and proper habits of the mother during pregnancy and the lactation period. Sometimes, however, there are children who have soft teeth in spite of what would seem to be the very best care. Such a condition may usually be charged to faulty assimilation.

Now, with the temporary teeth in the mouth, the mother should insist that the child use the tooth-brush at least twice a day, preferably night and morning, but especially at night, because the mouth is filled with saliva at this time, and if there are any particles of food left between the teeth from the evening meal the

child is sure to have fermentation taking place in the mouth. To get children to adopt this practice of cleaning the teeth regularly, and make a habit of it, the mother must clean her own teeth, and let the child see her do it. It is not enough to call to the child and ask if he or she has cleaned his or her teeth when the mother's mouth is really filthy, and she never cleans her own.

The most important factor in the care of the temporary teeth is the diet. Children eat too much of sloppy foods, and not enough of the coarse foods. The diet of growing children should consist of hard, brown, baked, whole-wheat bread to give the jaws exercise in the mastication of the food, and development of the jaws and bony structure, causing the firmer setting of the temporary teeth in the bony process. The roots of the temporary teeth are not developed when the child "cuts" the tooth, but the roots develop later, and are never stronger, or more firmly set in the bone, than is necessary. This necessity is created by the demand for real hard labor brought about by the tough hard food which is to be eaten.

The average consumption of sugar in the United States is 90

pounds per capita per year while in some of the European countries it is as low as 15 pounds. Too much sugar is detrimental and certainly the consumption in this country is entirely too high. In the feeding of young children leave off so much of the sugar, especially candy, and add more milk and fruit. The vegetables are good, particularly those which are eaten raw. Oranges are good, and should be given children regularly. Of the sugars, honey and molasses are laxative in nature, and are preferable to some of the other sweets. Some years ago the children, especially in the country, chewed rosin, which is among the worst things that they could have found for the teeth on account of the turpentine, and sweet-gum came in with its damage on account of sticking to the teeth with its sugar contents. A gum that is tough and containing no sugar is a good thing to develop the jaws and roots of the temporary teeth, but they must find a gum that contains a minimum amount of sugar, if any at all.

In the clinic work mothers come in almost daily asking, "What can be done for this little fellow's teeth? He is only 3 years of age, and his teeth are decaying at the gum line." This is the age that most good can be done the child for at this time the nitrate of silver treatment is applied to these cavities, and the decay is arrested, and the child is saved from future pain, as well as saving the tooth for use in masticating the food, and retaining it until the proper time to be shed for the permanent tooth. Lots of explaining has to be done to the mothers that it is necessary for these little teeth to stay in place until time for them to be pushed out, so to speak, by nature. When the temporary teeth are extracted prematurely the big muscles that close the jaws and lips which are working as rubber bands, and are always tight, have a tendency to constrict rather than expand, because their function is to keep the mouth closed, and when these little teeth, or wedges, are removed then all pressure which would tend toward expansion is re-

moved and there is nothing left for the green bone in the developing jaw to do but give way to the pressure and constrict and therefore not develop as nature intended, which in the end means that you may have a well-developed child with a normal size upper jaw and an under-developed lower jaw. This latter condition is far worse than a seven shoe on its right foot and a six on its left. In the latter instance the child walks, but it cannot properly masticate the food if the teeth in the jaws do not properly occlude. Aside from aiding in the proper development of the jaw, these temporary teeth roots act as guides to the permanent teeth and the latter are thought to be nourished by the resorption of the former. The development of the crown of the permanent teeth under the temporary teeth tend to spread the roots of the latter and in this way creates a form of expansion within the jaw which we would not get had the first teeth been lost. No temporary tooth should be extracted that possibly can be retained without detriment to the health of the child. Certainly there are cases when it is best to take the tooth out, but this should be determined by one competent to judge.

The history of a few cases which come to the clinic might illustrate a little better "The Care of the Temporary Teeth."

No. 1. A. B. Boy, ten years of age; lost both lower first molars of temporary teeth between six and seven years of age. Now at this time spaces are almost completely closed, and no place for first bi-cuspids to come through without being out of line. The upper jaw is normal, but the lower is the width of these two teeth short of normal. The child cannot properly masticate his food.

No. 2. C. D. Boy, six years of age; head well developed; body under-size; underweight. Mouth and jaws about the size of a four-year-old child. Very few teeth in the mouth, and what few there are are so badly developed that identification is difficult. Part of these are not firmly set in the alveolar process.

GUIDE FOR TEACHERS

CONTAGIOUS DISEASES

DISEASE	EARLY SIGNS AND SYMPTOMS	EXCLUDE FROM SCHOOL	METHODS
MEASLES	Begins like a "cold in the head" with running nose, sneezing, inflamed, and watery eyes and fever. It is during these days that others catch the disease. Rash appears in about three days. Take care of the sick. Pneumonia may cause death. Running ear may cause deafness.	In this group the patient is excluded until the date of quarantine has expired or a written permission signed by the quarantine officer is presented.	
GERMAN MEASLES	Onset sudden. Illness usually slight. No "cold in the head." "Kernels" in the back of the neck. Usually fever and some sort throat. Eyes may be inflamed. Looks like measles or scarlet fever.	No children in same family who have not had these three diseases, and no other children who have been intimately exposed, can attend school. They are to be excluded for a specified number of days. (See rules.)	These spread getting the sp from another the dis it in well a Contact during he is very c ple "c of som they g each which they a and ca to sp cases oous be officer. The presen one ca caution sores the d ear ar nels the scarlet one th discha people oous t the su "MET VENT
WHOOPING COUGH	Cough first like any ordinary one. Grows worse in a few days. Usually more coughing at night. Coughing occurs in spells, face flushes and eyes water. Vomiting in many cases of infantis. May never whoop.	Send suspected cases home and report names, etc., to the quarantine officer on a form card.	
DIPHTHERIA and MEMBRANOUS CROUP	May begin as ordinary sore throat and get no worse. May start with severe symptoms. In babies, begins most often as croup. Tonsils reddened. White patches may be seen or not present at all. Early use of North Carolina State Board of Health Diphtheria Antitoxin, which costs 25c, will save a life.		
SEPTIC SORE THROAT	Begins with soreness of throat, fever, and aching. Throat red. May resemble diphtheria. Only one case in family rarely seen. Usually epidemic and milk-borne.		
SCARLET FEVER	Onset usually sudden, with headache, fever, sore throat and vomiting. A fine rash appears next day on neck and chest. Spreads over body. Tongue looks like a strawberry. In mild cases, but for the appearance of the tongue, you would suspect measles or indigestion rash. Skin peels off later, depending on severity of disease. Deafness and kidney diseases frequently follow.	In this group the patient and all others living in the same house are excluded until the date of quarantine has expired or a written permission signed by the quarantine officer is presented. Under special conditions a teacher may remain in the same house. Consult the quarantine officer.	
CHICKENPOX	Very mild disease usually. May or may not have fever. Rash often only thing noticed. Pimples usually appear first upon chest or covered parts of body. They become filled with clear fluid. Fluid becomes yellow. Scabs form and may fall off in 14 days. Eruption appears in all stages at same time. Usually itches. Likely to be confused with smallpox. Occurs rarely in grown people.	Teachers should keep a copy of the rules governing each disease convenient and refer to it frequently.	
SMALLPOX	Fever, chills, and backache first noticed. May be mild or severe. Such lasts for few days. Then seemingly well, but pimples appear about face and wrists or the exposed parts, and often spreads over entire body. They become blisters and then fill with pus. Scabs form. Scars likely to result. Severest cases may be caught from mild ones.	The patient is excluded from school until the scabs have fallen off. Others may come to school. (See rules.)	
		All those successfully vaccinated who live in a home where smallpox exists can attend school. (See rules.)	

ERS AND PARENTS

SES AMONG CHILDREN

DO OF IN- CTION	METHOD OF PREVENTION	REMARKS
<p>diseases are one person to his mouth or discharges nose, etc., of person who has or has or had very mild, as severe form, with any one time when "getting sick" is serious. People "the germs diseases after well. Cases of disease occur so mild that not suspected the sickness. Unreported very danger- use the health not inform- one of their so that every take all pre- The pus from smallpox and sores of the obsessed ker- those who had may give disease. All from all be poison- ou. Follow stions under DO OF PRE-"</p>	<p>Cover up the cough and sneeze. Use your own handkerchief. Don't spit. Avoid contact with those having the disease, especially in the early stages. Use individual drinking cups. Don't bite same apples, food, etc., others do. Don't take plates, knives, forks, drinking glasses, napkins, handkerchiefs, etc., used by another. Keep your hands, pencils, etc., from your mouth and nose. Have clean hands when you eat anything. Do not overeat. Attend to your personal hygiene. Ventilate your rooms well. You can surely make an effort to follow these suggestions.</p> <p>Be careful with young babies, as many die when they have whooping cough or measles under three years of age. The least babies are taken visiting the better it is for their health, since by coming in contact with others they contract these diseases.</p> <p>While we are not able to say definitely, yet we believe that the use of fresh whooping-cough vaccine is beneficial as a preventive and in treatment. We have never heard of any harmful results from its use, and suggest it.</p> <p>To prevent diphtheria, every child between six months and six years should take three doses of toxin-antitoxin. They will most likely be protected for life, or any way until they get beyond the age of danger. Seventy-five per cent of those who die from diphtheria in North Carolina are children under six.</p> <p>In co-operation with the State Board of Health, campaigns were conducted during the summers of 1921 and 1922 in sixty-six counties, and as many as twenty-two hundred children were given this treatment in one county. Altogether nearly 50,000 children received this immunizing treatment to protect them against the most deadly disease of childhood.</p> <p>To cure the disease, large doses of diphtheria antitoxin are needed as early as possible.</p>	<p>If every person will do his part much can be done toward preventing these diseases and saving lives. Many of the suggestions may seem useless to you because you don't know the good in them as we do.</p> <p>The first step toward preventing the spread of these diseases is to obey this law.</p>
		<p>PARENTS REQUIRED TO REPORT (Consolidated Statutes, Sec. 7152)</p>
		<p>It shall be the duty of every parent, guardian, or householder, in the order named, to notify the county quarantine officer of the name, address, including the name of the school district, of any person in their family or household about whom no physician has been consulted, but whom they have reason to believe of being afflicted with whooping cough, measles, diphtheria, scarlet fever, smallpox, infantile paralysis, typhoid fever, Asiatic cholera, typhus fever, bubonic plague, yellow fever, or other disease declared by the North Carolina State Board of Health to be infectious or contagious.</p> <p>If you do not obey you may be brought to court.</p>

PENALTY FOR VIOLATION

(Consolidated Statutes, Sec 7155.)

Any person willfully violating any of the rules and regulations adopted by the North Carolina State Board of Health for the control of the diseases mentioned in this act . . . shall be guilty of a misdemeanor and fined not exceeding fifty dollars (\$50), or imprisoned not less nor more than thirty days, at the discretion of the court. In case the offender be stricken with the disease for which he is quarantinable, he shall be subject to the penalty on recovery, unless in the opinion of the secretary of the North Carolina State Board of Health the penalty should be omitted.

Most of these diseases are very harmful to one at the time he is sick, and may cause death. The heart, lungs, and kidneys are often damaged by them and show signs of it years later. Chances of death are greater with young children. For this reason, keep your babies away from all sickness.

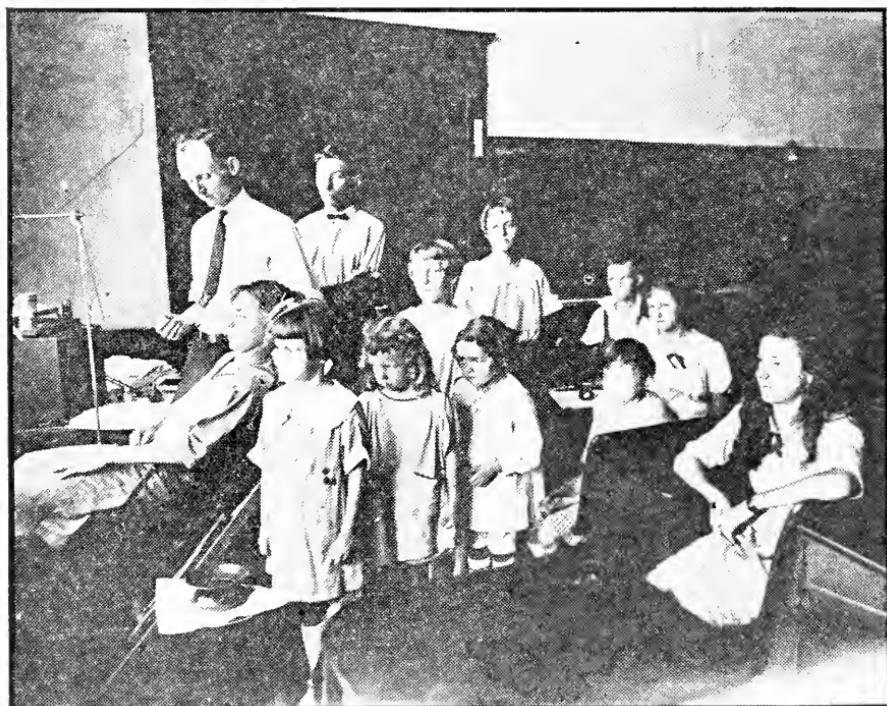
VENEREAL DISEASES

Mothers, fathers, teachers, and others should talk to our boys and girls about venereal disease (gonorrhoea and syphilis) control. Suitable literature will be sent upon application.

The mother gave the following history: Nausea during pregnancy. Able to retain but little food. Very little strength, therefore unable to take any exercise. At seven months fell in room across chair, and did not fully recover from fall until after birth of child, which was at eight months. Unable to feed child at breast. Child did not walk until two years of age, and had no teeth

enamel. History: Has had practically all "Children's Diseases," beginning with three years, and continued poor health until 15 years of age. Treatment will have to be restorative instead of preventive.

Especial emphasis must be placed on the proper diet of the expectant mother and the child. Leave off the white bread and polished rice and so much cereal. Some children eat



SCHOOL DENTIST AT WORK IN CLINIC

One of traveling dentists maintained by the State Board of Health treating children at the dental clinic held in the Burlington public school building during the present year.

until about eighteen months old. Not walking, and no teeth would indicate non-ossification of bone, and non-calcification of the enamel of the teeth, due of course to insufficient lime salts being provided in the mother's diet. Treatment suggested, diet of milk, vegetable liquors and fruit juices, especially oranges.

No. 3. E. F. Young lady eighteen years presented for consultation and not treatment. Most of teeth have no enamel on them, few with some, but none covered with hard

cereals three times a day. Hard bread requires much time in chewing, which means that it must be thoroughly insalivated before it can be swallowed. One of the faults of the people is eating too rapidly. Use foods which are mildly laxative, instead of constipating. See that the mouth is cleansed with brush and floss daily, and examined regularly by your dentist.

When a locomotive comes in on a trip it is examined for any defect to see if any repairs are needed. They

do not wait for it to break down. Should not as much be done for the children? It is wonderful to think of the temporary teeth masticating the food that furnishes the nourishment that develops bodies from an eight-pound bundle of innocence to a well-developed boy or girl of a

hundred or a hundred and twenty-five pounds, and the best of care should be taken of them. Examination requires little time, no expense, and no pain. Minor repairs are reduced to a minimum, but restoration in later life due to neglect is for further discussion.

WHAT A TEACHER CAN DO TOWARD GETTING THE CHILDREN TO BRUSH THEIR TEETH

By Mrs. L. K. Summerell

In 1919 the children of the fifth grade, Edenton Graded School, decided they would form a Health Club, and wrote an invitation to a local physician to give them a talk on that subject. Amongst the things he talked about was emphasized the desirability of owning good, clean teeth. They decided to start work on teeth.

From an enrollment of forty-five, twenty had brushes and used them every morning, ten had brushes and used them now and then, fifteen had never had them, ten bought brushes, the others were supplied.

The text used in health work gave the children satisfactory answers to all their "whys" about brushing the teeth; a local dentist came at their invitation and explained forms, nerves, structure and healthy gums to them, in such language as they could understand. This dentist later talked on this subject to the whole school, and gave a demonstration of cleaning discolored teeth.

The children learned that brushing teeth was something the whole world should be doing.

Tooth-brush drills were given from time to time, until all had learned the correct "form." This continued, at intervals, throughout the year. They brought in all advertising matter that concerned teeth, from whatever source. Many letters were written to the advertisers and invariably received courteous replies. Several posters were made by groups and placed around

the room. One of the first was "Save a Tooth" made by a boy, printed on a piece of wood, and placed in a conspicuous place. One morning a small boy from one of the lower grades, coming in to tell a story he had just learned, saw it and said, "I had a tooth pulled yesterday, and I'd have saved it for you, if I'd known about it." One of the grade that had been supplied with a brush explained to him very clearly what that board meant—he had made it.

Every morning each child entered his score on a large score card provided by one of the dental companies at the request of the children. At the end of the week, if a perfect score was made, a gold star was pasted over that record. The teacher inspected the teeth once a week; no one knew when this would be done; sometimes it was found that the teeth had not been brushed, when a score for clean teeth had been entered on the card. Having to rub out the score publicly, and a little talk with the teacher privately seemed sufficient punishment, and very seldom was it necessary to have the same child remove his score the second time. He would always hit upon some device to remind him of "his job."

This work has been carried on with each succeeding group for four years; has always had the "mind-set" of the grade. Next September, it is hoped, will find it a "whole-hearted, purposeful activity" of the fifth grade again.

SCHOOL SANITATION

By H. E. Miller, C.E.

Director Bureau of Sanitary Engineering and Inspection,
State Board of Health

School sanitation involves two major items of consideration, namely, water supply and excreta disposal.

Both of these subjects are fully covered in other publications of the State Board of Health and of the State Department of Public Instruc-

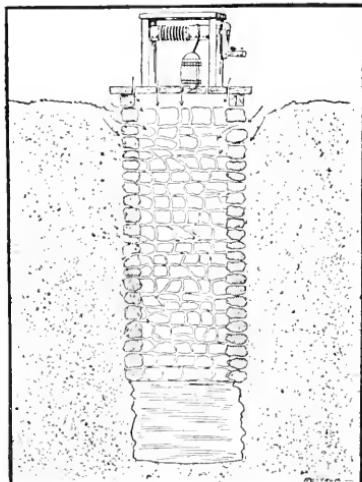


FIG. 1. Dug well showing openings through which surface pollution commonly enters

tion. Attention will therefore be given here only to certain practical considerations that have in many instances been observed not to receive sufficient consideration by school committeemen and other school officials.

Water supply for rural and semi-rural schools, where there is no public water supply available, usually presents a difficult problem.

In the central part of the State and along the coast the school water supply is usually secured from a well of some kind, while in the extreme western or mountain section the school water supply is quite commonly obtained from a near-by spring.

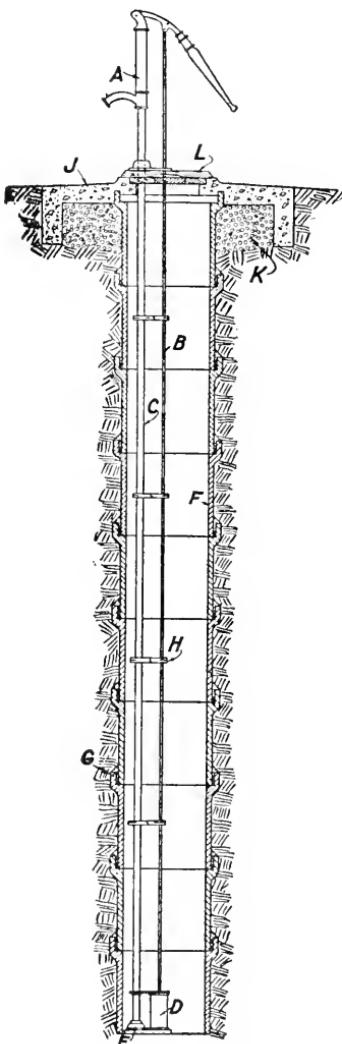


FIG. 2. Section of a dug well with pump showing proper type of casing and protection about the top. Curbed with vitrified socket pipe. (a) Pump stand; (b) pump rod; (c) riser pipe; (d) cylinder; (e) check valve; (f) vitrified socket pipe; (g) joints packed with a strand of oakum dipped in grout and filled with cement mortar; (h) pump rod guides; (j) platform; (k) gravel foundation; (l) cross-planked cover.

The purity of a drinking water supply is governed by two simple requirements: (1) Protection against access of surface drainage and surface contamination of all kinds. (2) Protection against access of dangerous dirt and filth through underground channels. The importance of these two factors is in the order given, though it is the tendency of the average mind to put underground contamination first.

THE SCHOOL WELL

There is illustrated in figure 1 a well so constructed as to constitute practically no protection against

THE SCHOOL SPRING

Springs are ordinarily held in very high regard as sources of drinking water. In fact, the tendency is too much in this direction, according them an unquestioned acceptance without regard to their origin or surrounding conditions. The spring differs essentially from most other sources of water supply, in that its location is fixed by nature. This location also is least to be desired, being commonly at the bottom of a hill and consequently in a position to receive drainage from the hillside.

Frequently also the spring crops out at, or near, the margin of a stream, subjecting it to the danger

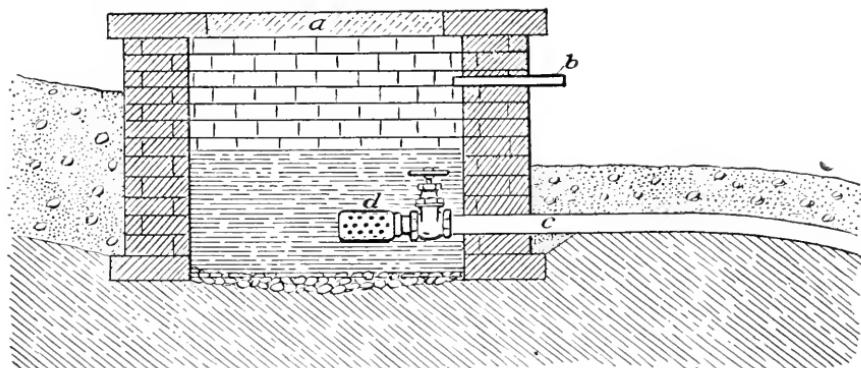


FIG. 3. Properly protected spring with top entirely covered with concrete slab, A; overflow pipe, B; drain pipe, C, to be used when water is to be piped to a distant point; and strainer, D.

contamination of the water in the well either through route (1) or (2) as outlined above. This well is quite representative, however, of the type and character of the average rural school well. In figure 2 is shown the same well after being curbed with vitrified socket pipe laid with carefully sealed cement and oakum joints, and fitted with a pump mounted on raised concrete watertight platform.

In this remodeled condition the same well shown in figure 1 has been so protected as to eliminate possibility of contamination through source (1) and practically eliminate it through source (2), especially if the well is properly located with reference to its surroundings.

of overflow in times of flooding. Since these things are so, especial care must be taken to shed away all surface water. For this purpose it is necessary to provide the spring with a water-tight curbing to a height of at least 2 feet (see figure 3) allowing the water to run in at the bottom and out at the top. In addition, an appropriate water-tight cover should be provided to keep out domestic and other animals, and leaves and other trash. Being unable to exercise choice in the location of the spring, one must choose its surroundings instead. That is, no human habitation, school, playground, or place where people congregate, or privy, cesspool or stable should be allowed on the area sloping directly toward the spring.

DRINKING CUPS

In order to prevent the spread of contagious diseases, the common drinking cup, as well as the common tooth-brush and comb, must be abolished, nor should the individual metal or earthenware drinking cup be allowed, because pupils very rarely have a suitable place in which to keep them. Consequently, they are usually as great a source of danger as the common cup itself. Also, the "swapping" of cups is a common practice. In the larger schools it may be found possible to supply paper envelope cups in a holder, for general use in the schoolroom. By allowing local merchants to print their advertising matter on the cups, it should be easy to get them supplied free of charge, as has been done in some counties. The most economical and most practical drinking cup is that made by folding a clean sheet of paper. Every pupil should be taught to fold his own cup. He will then always have a clean cup, and the practice of "swapping" will thus be eliminated.

The drinking fountain is an improvement over any individual cup system, and no schoolroom should be considered completely equipped without one. The majority of so-called sanitary drinking fountains, however, are by no means sanitary. The only type of drinking fountain which can be considered safe is one so constructed that the water issues from an opening at one side, and is directed upward at an angle with the vertical position, falling back into the basin at the opposite side. The water in this way takes the course of a parabola, and drinking is done from the highest point. Also, a frame or guard should be so arranged that the lips are not allowed to come in contact with the nozzle. Fountains that are not constructed in this manner become contaminated, and are only a slight improvement over the common drinking cup.

EXCRETA DISPOSAL

Excreta disposal for the large schools, located in towns and cities where there is a public sewerage sys-

tem available, is a simple problem. For the schools in villages and in rural sections where there are no public sewerage systems available, however, the problem of excreta disposal becomes more difficult.

The General Assembly of 1919 enacted a law requiring all public schools to be equipped with sanitary toilet facilities not later than September 1, 1922. This law is known as Chapter 213, Public Laws of 1919. It holds the county superintendent of public instruction and county board of education responsible for the installation of sanitary toilet facilities, and it holds the local school committeemen responsible for the sanitary maintenance of school toilet facilities. Some counties have done very creditably in this matter, but in many counties very little progress has been made.

For the average rural school, especially small schools where there is no regular janitor, it has been found that the earth pit type of privy is most suitable, on account of the very slight amount of attention required for satisfactory maintenance.

For the larger school, some kind of indoor toilet is preferable. In such cases either sewerage or chemical toilets are found most satisfactory. For schools of 200 pupils or more, sewerage is economical, and certainly ought to be provided. When there is no public sewerage system available the problem resolves itself into a matter of providing suitable and adequate facilities for the treatment and disposal of sewage.

In some communities there may be a stream near at hand which is not used as a source of public water supply, and which does not become tributary to another waterway which is used as a source of public water supply. If this is the case, and the stream itself is sufficiently large that the discharge of untreated sewage into it will not give rise to a nuisance, the sewage can be discharged into the stream without treatment.

If, however, the stream is used as a source of public water supply, some form of treatment would have to be provided which will meet with the

approval of the State Board of Health.

In most instances, however, there is usually no stream of any size available. In such cases rather extensive treatment facilities are necessary. In such instances it has been observed that the school committeemen, or other persons in charge of the building program, become a prey to a pernicious system practiced by several of the manufacturers of septic tanks. It was never intended that small tank units of one, two, or three-hundred-gallons capacity should be used in large numbers such as in batteries of ten, fifteen and more to provide enough volume of tank capacity to treat large quantities of sewage. On account of the unfamiliarity of most school building committees with matters of this kind, an architect is usually employed to design the building, who plans a structure that will consume all of the available funds in construction, and the matter of sewage disposal is left until after the building is completed. Then in an attempt to get by as cheaply as possible, bids are taken on septic

tank equipment, and the community's money is almost as good as wasted.

The fact is that the matter of sewage disposal is one of the first things which should be settled, and it should be one of the major factors in determining the location of the school building. The architect should be held responsible, and the building committee should require that he either inform himself along these lines or obtain the services of an engineer competent and experienced in the design and layout of sewage disposal facilities of this nature. The law requires the approval of the State Board of Health on all such projects, and the committeemen, for their own protection, should demand that the architect secure this approval before proceeding with the installation.

The State Board of Health or State Department of Public Instruction will be glad to furnish, at any time, copies of the regulations governing the installation of excreta disposal facilities for schools. These regulations cover both privies and sewage disposal.

THE COURT OF HEALTH

Written and presented by Seventh Grade, 1923, Thompson School,
Raleigh, N. C.

Julia Wetherington, Teacher

CHARACTERS

King Milk
Duke of Bath
Queen Sunshine
Duchess of Soap
Sir Breakfast Egg
Bobby, an Aviator
Mr. Down-and-Out
Health Doctor
Health Nurse
Tooth-Brush Emperor
Empress of Fresh Air

Fruit Pages: Grape Fruit, Orange, Raisin, Prune, Apple.

Vegetable Courtiers and other helpers: Peas, Beans, Tomatoes, Pure Water, Calorie.

Bobby—Last night I had a wonderful dream. I was riding in an aeroplane and visiting North Carolina cities. While riding over Raleigh I saw a large banner floating in the air in front of the courthouse. I stopped my plane as near as I could and went in to see what big ball game was on for that evening. But instead of a ball game I found these words, "T. C. H." I said to myself, "What does that mean?" A lot of things came to my mind. What could it be? Oh! I know, "Tomorrow Comes Harding!" or "Tourists Come Here"—that is it, I know. So I went inside to see. The first door I saw had this sign, "The Court of

Health," and to satisfy myself I went in. I found that the Raleigh Court of Health was made up of the 7th grade (1923) of Thompson School, and its doctors in charge were Margaret Harrington and Elva Honeycutt. They were very nice to me and asked me in to meet the Court.

I will now let you meet them as I did. King Milk, will you come forth?

King Milk—I am King Milk. I came to Raleigh to help little babies and weak people who want to grow strong. I have all of the five food substances in me. Almost everybody likes me because they want me to lead them to good health.

Bobby—It is true that King Milk strengthens us, and Queen Sunshine, we see your shining light.

Queen Sunshine—I am Queen Sunshine. I peep in through the cracks and through the windows to see those who are sick, to smile at them and cheer them all I can. I make everybody cheerful and happy when I appear. All the children run out to see me and then I kill disease germs.

Bobby—I feel Queen Sunshine's rays on me now. Duke of Bath, will you appear?

Duke of Bath—I am the Duke of Bath. For health you should take a bath every day. Perspiration is a mixture of water and waste that pours out of the sweat glands when the body is heated or exercised. It mixes with oil from the oil glands, with dust from the clothes and air, and it sticks to the body like a thin coat from head to heel. It should be washed off to open our pores.

Bobby—One look at the Duke of Bath proves all that he has said. Duchess of Soap, will you tell us of your cleanliness?

Duchess of Soap—There are a lot of people that have my name but not all are so good and pure as I am. I have been in every home in Raleigh. I go in the front door, into the rooms, and then in the kitchen. I scrub the pans and floors. I keep people's bodies fresh and clean. No wonder Queen Sunshine smiles all the time, coming in after me.

Bobby—But the Duchess of Soap cannot do all the work alone, so Tooth-Brush Emperor, tell us of your brave deeds.

Tooth-Brush Emperor—A soldier in the army fights for the rights and liberties of our country, but I fight for something even greater than that. With the tooth-brush, I fight for health and safety against dirty, uncared-for teeth. If you let your teeth get dirty, it will cause many kinds of diseases, but if they do, send for me.

Bobby—Sir Breakfast Egg, will you show us your strength?

Sir Breakfast Egg—I am Sir Breakfast Egg. I have more friends that I help than anybody else in Raleigh. They ask me to breakfast because I carry them 13.4 protein, 10.5 fat, 73.7 water and 1 mineral matter. The only food substance I don't have is carbohydrates. So if you will eat plenty of oatmeal with me, that has 67.5 of that substance, you will feel good after breakfast.

Bobby—Fresh Air Empress, how do you help us?

Fresh Air Empress—I am fresh air. I carry oxygen into the lungs and there I leave it and bring out the impure air. Be sure that your windows are open at night, and never let your rooms and houses get too tight for me to get in. Walk with me and Queen Sunshine and we will take you to good health.

Bobby—Your Court is doing a great work in your city, but I see you have some helpers that I want to know about. Fruit pages, will you tell us of your value and your work?

Prune—I am a prune. I help Mr. Breakfast Egg out. People like to eat me because I make them healthy and strong. I am raised in a warm climate. Store men sell me for forty-five cents a pound, but that is cheap for I have so much value in me.

Apple—I am an apple. I am very helpful to the body. People eat me because "An apple a day keeps the doctor away." I am raised in almost any place that has a cool climate.

Raisin—I am a raisin. School children eat me for lunch because I give them calories. I am chiefly raised in California. I am sold in large quantities at grocery and fruit stores, and at Christmas times I find my way into many boys' and girls' stockings.

Grape Fruit—I am a grape fruit. I come from Florida to help the people of Raleigh. I want to visit every home here before I go back. If you don't know me, I am yellow like an orange, but I am larger. I am sold for a high price but I am worth all that I cost.

Orange—I am an orange. I am very nutritious. If people eat a lot of oranges they will always stay well and happy. I am raised in large groves, in warm and also tropical countries, and I am shipped all over the world. Many people eat oranges and find them good. Children cry for me and everybody likes me.

Bobby—Your work, Fruit Pages, pleases me so much that I want to meet all that help the Court. Vegetable Courtiers and others, how do you help the Court?

Pea—I am a green pea. I come to Raleigh in the spring and fall. I have part water, carbohydrates and fat which gives energy and warmth to the body and which rebuilds the body as it wears out.

Tomato—I am a tomato. I am first green and then red. I am very good and very nourishing to the body. I grow where the climate is warm and moist. I am made up of .9 proteid, 3.9 carbohydrates, .4 fat, 94.3 water and .5 mineral water. My work in Raleigh is to make people healthy and happy.

Bean—I am a bean. I go to dinner with every family in Raleigh and give them 170 calories for their dinner. I have starch for the body. I help strengthen the bones and help to gain.

Calorie—I am a tiny little calorie. I do not have a home to live and grow in like the others, for I live in all the things that the other members of our Court give to you. In one pint of King Milk I have 325 places, in one-half pint of soup 100

places, in egg sandwich 230 places, in baked beans 170 places and so on. Each person in Raleigh should eat the amount of foods that give them 2,400 of calories every day. My work is to give heat and energy to the body.

Pure Water—The people in Raleigh can't live without me. Water is a food. We need pure water just as much as we do other foods and fresh air. Water helps our bodies to get rid of a lot of poison. Get in the habit of drinking more water every day to help your body keep strong and well. (Mr. Down-and-Out knows.)

Mr. Down-and-Out—Beg your pardon, but may I speak to the officers of the Court of Health?

Dr. Honeycutt—Come in, sir, the Court is glad to have you. Will you tell us your name and your needs?

Mr. Down-and-Out—My name is Mr. Down-and-Out. I came to live in your city because I want to live where a sick person like I am can get help. (Stops—hands tremble.)

Dr. Honeycutt—Keep on, will you tell us your story?

Mr. Down-and-Out—I had a good job but I got sick and now I can't work. See how I stand; I am bent over with pain, my hands tremble and I cannot eat.

Dr. Honeycutt—We will do what we can for you; King Milk, I know, will help you, but first of all I will turn you over to the Duke of Bath. Duke of Bath, will you help this man? (Health nurse brings a basket and each member of the Court drops into the basket a portion of what he has to offer Mr. Down-and-Out.) (Duke of Bath leads him into another room.)

Mr. Down-and-Out—(Talking to himself) All people like me ought to come to the Court of Health.

(All assemble and sing "Smiles".) There are foods that make us happy, There are foods that make us blue, There are foods that steal away your good health, As the sunshine steals away the dew; There are foods that make us well and happy

That the Court of Health alone have seen,
So the foods that fill my life with sunshine
Are the foods that give health to me.

There are fruits that make us healthy,
There are eggs that make us strong,
There are vegetables that help us to keep well,
And tooth brushes make our teeth last long,
There is milk and sun to make us happy,

Soap and baths to make us clean, you see,
But the thing that fills my life with gladness
Is the health that they give to me.

(Mr. Down-aut-Out reappears with basket on his arm still eating of its contents, clean hands and face, hair combed, and smiling, stands with the Court.)

Bobby—I want to thank the officers for allowing me this visit. But now I must hasten away in my plane to tell other cities of your great work.

BRINGING UP CHILDREN

A PROBLEM IN MENTAL HYGIENE OF INFANCY AND CHILDHOOD

By Jessie Taft, Ph.D.

Director Department of Child Study, Children's Bureau and Children's Aid Society of Philadelphia

THE NEW SCIENCE OF MENTAL HYGIENE

If you want to find a new food, a new fabric, a new way to travel by land, sea, or air, an improved method for breeding pigs, all you have to do is to go to the scientist. "Ask and it shall be given unto you" is more than fulfilled in modern physics and chemistry. If you need advice on how to bring up children, so that they will become happy, energetic, confident, social, efficient, courageous men and women, you may have to inquire in many quarters before you receive a satisfactory reply. It has taken the world a long time to realize that human behavior is the most important thing in it, and thus far only a few scientific minds have applied themselves to studying the behavior of people just as a chemist studies the behavior of atoms and molecules.

From such students of human activity we are beginning to get new light on the way our children behave and why. They are not only laying bare the hidden springs of conduct; they are giving us the hope of something approaching a control of conduct. We may expect to learn in time how changes in behavior are

brought about and how the undesirable attitudes, moods, and habits can be replaced by reactions more advantageous to the individual and society. In other words, they are promising mental as well as physical health, if we are willing to make the effort. Those of us who have been teaching or rearing children by instinct, precedent or rule of thumb methods will have to shake ourselves free of all our old habits and try to look at young people with fresh eyes—try to see them as interesting, unsolved problems, each child an individual different from every other in the world. What works for Johnny will not necessarily be effective with Mary. There are no short cuts. We have been misled by such rash generalizations as "Spare the rod, spoil the child." They have come to have an unwarranted power over us through the weight of age and constant repetition. There is no one rule to be followed with all children, and we must free ourselves from any sense of fear or sin when we cut loose from traditional sayings in our efforts to see each child's behavior as a new problem worthy of our best thinking and experimentation.

NEW VERSUS OLD ATTITUDES IN CHILD PSYCHOLOGY

Now what are some of the fundamental things the scientist in human behavior is telling us about children? Theoretically they seem rather simple and not so new, yet when we really try to act on them, we may find that they go against deep-seated habits of feeling and thinking. They hit many ancient prejudices and stir up resentment in us because our comfortable, blind ways and selfish interests are disturbed. Let us not, therefore, give too easy and complacent assent to the theories, failing to realize what is implied in their application, but be prepared to think, weigh, and try out, even in the face of personal discomfort and a sense of sin at so outraging time-honored, traditional methods.

Instead of making statements that all might accept easily without realization of their implications, supposing we put some of the new psychology in ways that bring out its opposition to our older methods.

Human beings are not essentially different from animals. It is impossible to understand children without seeing how their ways of behavior have grown out of a long, gradual, evolution of animal life. There is no split, no miraculous difference.

It is natural for children to be interested in all parts of their bodies and all of their bodily functions. It is a grave mistake to teach them to think of excretion or the organs of excretion or sex as something mysterious or sinful.

There is no particular virtue in submission or obedience as such. Children's wills are not benefited by being broken.

Failure which is not compensated for is bad for a child. Success is biologically necessary and wholesome.

There is no virtue in forcing a child to do what is hard. The essential quality of work is not hardness or unpleasantness. Spontaneous interest is a better driver than forced attention.

Expression is a better source of discipline than repression. Punishment administered from the outside is less effective than the internal control of a compelling interest.

Emotions, desires, impulses are more important than intellect and ideas.

A child is not necessarily bad or unnatural because he acquires a habit of self-abuse or lying or taking things that do not belong to him. Such habits are potential in all children and arise from needs that are not being met by the home.

By this time our Puritan ancestry rising up in us is doubtless protesting against such laxness and easy virtue. The path of righteousness ought to be hard and stony. How is it possible for the good way to be pleasant? The scientist can only answer that we have given our own methods an age-long trial. We have not developed any of the sure control that science can show in the physical world. It is time for us to open our minds, give up our prejudices, and let science show us the facts of human behavior even when they seem to go against customs we hold dear. Science will lay bare many things which are unpleasant to us but it will show how we can get mental health and happiness for our children if we are not afraid to see human beings as they are.

Human Beings Not Primarily Rational

The first preconceived idea we have to overcome before we can begin to look at behavior as it really is, is the firm belief that we are all rational beings. Neither children nor adults are primarily rational. None of us, however intellectual, are motivated by ideas. The whole development of animal life is in terms of action in response to some need of the organism. Need of food, need to escape danger, need to mate or procreate, need for air, warmth, light—these are the primary moving forces. Ideas and reason are very recent additions

to the equipment of this moving, seeking, striving animal world. They are intended primarily to insure a more prompt, adequate, and safe satisfaction for those needs which are of first importance to life. The motive force in all of us, adults and children alike, is what we need, desire, want, not what we coldly think. Remove the drive of needs and impulses and life stops. It is energy, the will to live, the something which keeps all normal organisms struggling to exist, that is vital. Ideas of themselves have no power unless our desires give it them. Intellect is like the steering gear of an automobile—it is useless unless there is power.

Our needs set up the ends for which we strive; intellect works out the best method by which those ends can be obtained. Of itself, intellect is neither good nor bad; it works equally for the good or the evil end. My desire is to build a house. That desire furnishes the motive force. The idea of the house, the details of the architectural plan as such, have no force except as my wish is for that particular object. If I were set on a boat instead, the idea of house would not affect me. But, given the desire, the idea furnishes the plans whereby it is realized. It is the servant, the worker, the instrument. Desire is master. No one need worry about the immorality of this fact. There is no inherent vice about needs or wishes. It is quite as possible to wish good things as bad. The only thing to look out for is that one does not fail to recognize the wish at the bottom of all conduct, even when it is not praise-worthy.

Rationalization a Common Frailty

Here we come to the great weakness of all human nature and the greatest misuse of that most valuable instrument, intellect. Intellect ought to be used to work with hard facts in a real world, but what we all do is to use it to deceive ourselves and others by disguising from ourselves the real wishes back of our behavior and assigning beautiful, rational motives which accord with our ideas of right and wrong and keep us feeling virtuous and at peace

with ourselves. The psychological scientist calls this rationalization. It is one of our worst vices and the greatest obstacle to understanding children as well as ourselves and other people. The only way to overcome it is to be willing to see the wish back of every act even when it is not a pretty sight. When we can do this with ourselves, we can begin to see children as they are without abhorrence or over-idealization.

A simple illustration of rationalization is saying we are too tired to go to church or that our cold is too bad to permit our going, when we might find, if we looked deeper, that a comfortable chair by the fire, a new novel, and a bleak day outside were contributory factors. We are made more conscious of the cold or the tiredness by the active desire to stay at home which is conflicting with our customary interest in going to church, but would be repressed sternly by us if not disguised by the legitimate reason which our physical condition can be made to supply. If some really powerful desire were driving us out, we should probably reason ourselves into thinking that the cold was better or might be helped by fresh air. Such "wishful thinking" as this is far more universal and deep-seated in everyone than we imagine. We build up a morality or religion which makes us comfortable and then we are not able to recognize in ourselves or our children any desire, however natural, that would tend to destroy what we have built up. Some of us have ideas of sex which are not in accord with facts. We are then obliged to repress or rationalize any expression of sex or impulses toward such expression which are contrary to our theories or conviction. We may assume that children have no sex interests or feelings. Thereupon we do not permit ourselves to see the expression of sex interests in our children. It is our theory that no decent woman really longs for the physical side of sex life. We must then repress or disguise from ourselves the existence of such natural impulses and in so doing perhaps destroy our own happiness.

Children the Victims of Adult Self-Deception

In no direction, except perhaps along sex lines, are we so blind to the influence of our own wishes as in our relations to children. As parents or teachers we become utterly confused by the difference between the real good of the child and our own personal desires. Until we are clear on this, until we are able to catch ourselves in our rationalizations about children, we shall not be fit to deal with them, much less to understand their behavior and ours.

The discipline and training of children are too often largely a matter of adult comfort and are rationalized into theories as to the necessity of instant obedience, freedom of expression, certain kinds of food, or a particular vocation. The lazy parent lets the child follow his own whims as to food, bedtime, clothes, and play. The stupid parent teaches the child all of his own irrational food, thought, and work habits as the only right ways of behaving. The irritable parent makes the child respect his irritability. Silence, submissiveness, inactivity, not being in the way, become virtues. The domineering parent insists on expressing his own tastes and interests through the child. The child must be, do, or like just those things which the parent finds supremely desirable. None of this done in the name of rational discipline has conscious, moral, or educational value. It depends largely on the chance method which the adult chooses of having his own way, preserving his comfort, expressing his desires. It has nothing to do with an objective appreciation of the child, his needs, and the moving forces back of his behavior.

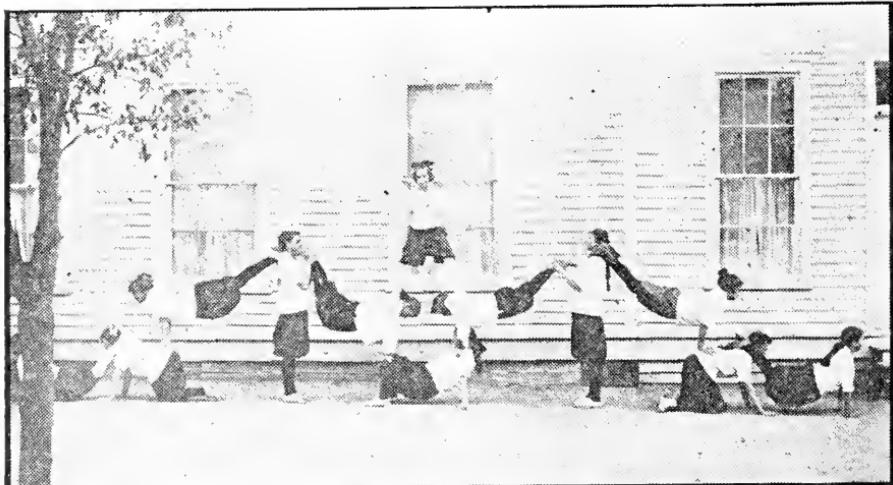
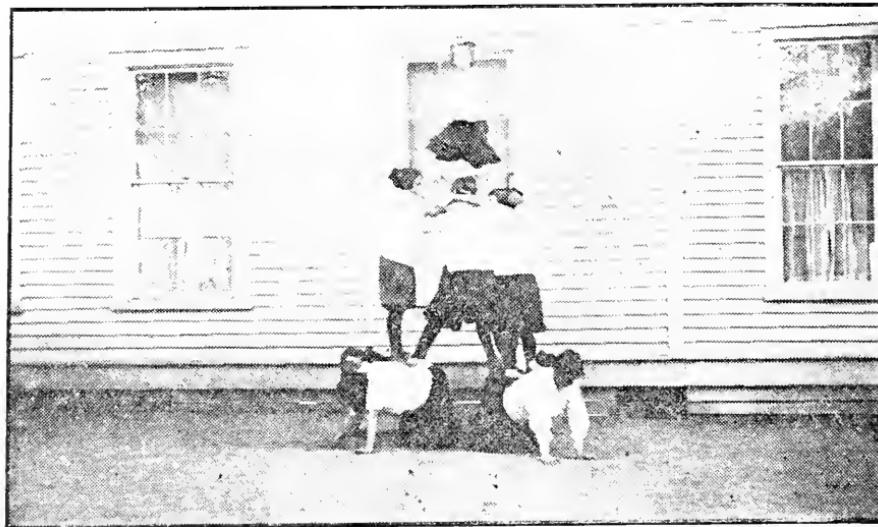
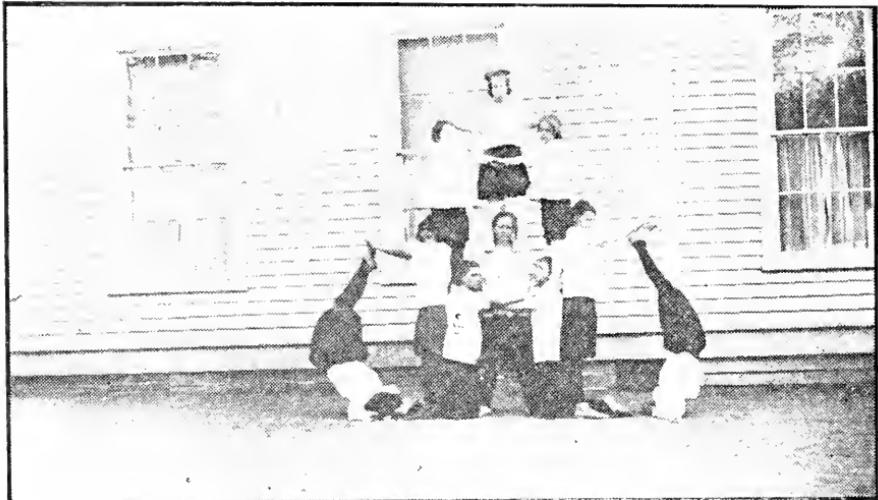
Rationalization the Basis of Misinterpretation of Children

Parents and teachers are apt to label a child in this rationalizing fashion, to brand him according to the way in which he happens to interfere with their wishes or prejudices. The child who does not respond at once to adult wishes is obstinate. What his refusal to act means to

him is usually not investigated. Back of obstinacy one frequently finds fear; a sense of inferiority, a certainty of failure. Not trying to do what is asked is a safer thing than exposing weakness. Back of obstinacy may be a genuine struggle to preserve the integrity of the personality against the overwhelming ego of the adult.

Adults are very ready to call a child lazy simply because work for them does not interest him as much as work for himself, which they call play. They ought to watch that child when he is engaged in his own pursuits. Perhaps he is tireless and persistent when he works for himself. The child who does not come on the instant when he is called is usually considered disobedient. He has perhaps been ruthlessly interrupted in the midst of what is to him an important piece of work. All of his interests are engaged, concentrated upon an end which is about to be accomplished. His unwillingness to leave his job is a splendid quality, but it conflicts with an adult world which fails to make allowances. A small boy of nine who is called in to take a bath before dinner exhibits a sulkiness and resentment quite out of proportion as far as the adult can see. At bed time he manages to come out with the deep sense of injustice from which he was suffering. The adult had called him quite without regard to what he was doing and had not bothered to inquire why he was not ready to come at that moment. He was at a critical point in the construction of an elaborate fort, which was to him a serious project. His point of view had been ruthlessly ignored and the work value of his play not respected.

Just as we are not rational in our behavior, so the child is not rational, but is moved by impulses, needs, and wishes which he himself does not understand. We cannot, then, expect to influence his conduct primarily by reasoning or to find out by asking him why he behaves as he does. We have to accept the fact that everything he does is a more or less blind effort to meet a deep-seated need of his own, an attempt at adjusting



TRY THIS ON YOUR PLAYGROUND

himself to his environment, just as every animal organism is impelled to do. Once we have freed ourselves from our own rationalizing, we may hope to look at the behavior of children objectively as something to be studied and understood in the light of the needs of the child, the environmental situation, and the history of the child's development.

The Primary Needs of the Child

What is the child trying to get? What are his essential needs? What is he trying to satisfy through his behavior? We can be sure that certain driving impulses are at work even when we are not able to find just how they are being expressed. The infant is aroused to activity almost entirely by three needs: the need for food, the need to excrete waste, and the need for air. When not impelled to struggle for the satisfaction of these wants, he is content to sleep. We must recognize how complete is the absorption of infancy in these primary moving impulses and how natural is the interest which all unexpressed human beings feel in the organs and the function of excretion as well as in the taking in of food. The pleasure that is associated with sucking is intense and far-reaching in its influence on the human being throughout life. To the infant it represents the realization of his most perfect happiness, warmth, protection, nourishment, rhythm of motion, pleasant tactal sensations. It is not to be wondered at that thumb sucking is such a common habit. Nail biting also is an allied activity related to the early pleasures of life which we are loathe to relinquish. Urination and defecation are likewise associated with the pleasures of relief from pressure, pleasant tactal and temperature sensations, the loving attention of the mother, and the interest of producing something, a sort of creation which comes from one's own body.

There is great danger in giving the child the wrong attitude towards these natural interests. The overattentive mother may make the early experience so pleasurable that the in-

fant has difficulty in giving them up for more developed interests. He may cling to the joys and sensations of this period to the neglect of later stages of growth. On the other hand, the mother who is disgusted at natural functions, or who is horrified at the child's interest in them and gives him the sense that there is something very wicked about his body, is building up a harmful conflict of impulses in the child. The interests which have to be repressed violently take on undue value. The child has to struggle against them, thus strengthening them and fixing his attention on them. He may be unable to free himself from their attraction as he should do in the natural course of development. He may succeed in repressing the outward expression of interest and may deceive himself, while there remains a fear, a lack of freedom in his attitude toward his own body and the natural functions, and an over-valuation of their importance even though it be expressed negatively. Such an attitude is apt to be carried over into a horror of sex or an attempt to repress natural sex impulses.

The best way to treat the first interests of the child is to take them in a simple, frank, matter-of-fact way with no undue emphasis. Satisfy his curiosity; allow him to express his interest. Treat it all on the basis of natural fact, and see to it that he gets every opportunity to develop responses to other stimuli. He will grow away from infantile desires naturally if nothing is done to fixate his interests and if he has plenty of opportunity in the environment and is not forced back upon his own body for lack of other things to do. The chief trouble usually lies in the false attitude of the adult who reads into the child's behavior all of his own ideas of sex and his own sense of sin and wickedness associated with the bodily functions. We must learn to take all moral quality out of these early interests of the child. Too often the adult speaks of a young child as unnatural, immoral, a sex pervert, abnormal, and what not, simply because he is normally interested in the pleasant sensations

connected with his body. Too often the adult puts his own fear into the mind of the child, telling him that playing with his genital organs will lead to insanity or will make him an idiot or give him St. Vitus' dance and the like. Needless to say that such statements are as untrue as they are dangerous to the future happiness of the child. It is normal for the child to be interested in his body, and there is hardly a child who has not expressed that interest at some time or other in the investigation of all parts of his anatomy and in experimental playing with the various organs and functions.

All Behavior an Attempt at Biological Adjustment

Every child is impelled to succeed, to get for himself a sense of power and at-homeness in a strange world. Biologically this is a necessity. Every organism struggles to adjust successfully. Too much failure is bad. No child can stand an overdose of defeat, and if it is forced on him by adults or his own defects, he will automatically try to compensate. Success is sought in approval of adults or other children, in physical beauty, skill, strength, or prowess, in intellectual achievement in work or play, in some special talent or skill.

Any source of weakness, a physical defect, a lack of grace or beauty, disapproval from adults, a sense of not being loved, an intellectual inferiority, poor health, lack of courage and energy, ridicule, a domineering parent, lack of opportunity for play or self-chosen work, failure at school, unpopularity with other children, especially the opposite sex, a social inferiority due to poverty or delinquency, a sense of sin and social ostracism arising from a hidden sex interest, or other forbidden conduct—any one or more of the infinite possibilities of handicap, physical, mental, or social—will make it difficult for the child to obtain the sense of assurance, well being, and at-homeness which we all seek. Where he is not able to get a satisfying sense of power in one way, he seeks it in another, although he him-

self may have no notion of what his conduct means. Who does not recall the agonies of inferiority suffered because of red hair, over- or under-weight, over- or under-weight, a big nose, outstanding ears?

Unconscious and Undesirable Forms of Compensation for Inferiority

The child who for any reason, perhaps lack of physical skill and strength, is not popular with children, may easily over-compensate by trying to outshine others in school and win the favor of teachers. The child who is inferior in intelligence and is not equal to the school work but is forced to face daily defeat and disapproval may develop almost any form of compensatory activity. Some children become obstinate and refuse to co-operate in any way. Others grow "smarty," become the goats of the school room, spend their time trying to draw attention to themselves and upset discipline. Still others go into delinquency outside school. The more sensitive child may become emotionally depressed or nervous and unable to use the little ability he has. Masturbation, lying, boasting, stealing, may easily appear as ways which the organism uses to compensate for the inferiority and failure in school. The child unconsciously seeks to comfort himself, to make up in some way for the hurt he is receiving, to gain pleasure or a sense of accomplishment.

The child who has a great lack in his home life, who is perhaps without social standing or without parents, will frequently take to boastful storytelling. He will brag of his relatives, of their power and possessions, or of his own feats. This is nature's attempt to make the individual feel strong and comfortable in the face of a great lack. We usually label it lying without any attempt to interpret it.

A child who has no other way to control the environment, or who has never been taught to use direct methods, will often tyrannize over adults with tantrums, vomiting spells, all kinds of moods and physical symptoms. He satisfies his de-

sires in this indirect way and gets a sense of power and control over his world at the same time. Moreover, he avoids the effort of working to obtain his ends in a legitimate fashion. He clings to the infantile stage of development because he can satisfy his primary needs without effort by the methods which worked when he was a baby. When we adults cry to obtain our ends, use moods, illness, or temper to bring our families to time, we too are using infantile methods of controlling the environment.

One of the most insidious and easy ways of compensating for failure or fear of attempting to succeed, is day-dreaming. The child who lacks courage and initiative, who is easily repressed and submits to every obstacle, will often refuse to compensate in any active way, but will seek refuge in dreams. This type of child attracts little attention at first. He is quiet, submits to discipline, gives no trouble at school, never rebels or quarrels. He evades, however, all responsibility, is unduly modest and retiring, shunning the limelight and social competition. He tends to avoid companionship of other children, likes to stay alone with a book or his dream world.

All of us do a certain amount of day-dreaming. We comfort ourselves, soften the hard places, shorten the time of waiting by dream fulfillment. In dreams we accomplish all that we most desire, we are brave, beautiful, successful, beloved. It is a seductively easy and satisfying process. If carried out to the extent of unfitting the individual for dealing with real people or the facts of a real world, it is fatal to mental health and happiness. Dreams which are really plans, dreams which are inspirations and are followed by action, are legitimate. Dreams which are purely sugar-plum comfort and substitutes for accomplishment are allowable only when they occupy too little time to interfere with a successful attack on the facts of the real world. In children any tendency to use them to evade real issues should be carefully watched.

CHANGING HUMAN BEHAVIOR

External Versus Internal, Repressive Versus Expressive, Methods

What is the relation of this interpretation of behavior to discipline and education. How is undesirable behavior to be altered? It may be possible to see that it is fulfilling a need of the child and yet something must be done about it. The child cannot be permitted to continue his unpleasant or anti-social habits.

As soon as we get to the point of changing the child's behavior we have to guard carefully against rationalization because our own driving wishes are at once involved. If we do not scrutinize our reactions keenly, we may find ourselves simply putting the lid on, stopping by the sheer weight of our superior force activities which irritate, repel or alarm us. It is so easy to discipline in this way and so natural to cut off short, to destroy any unpleasant stimulus which is under our control.

There are many relatively unimportant things which to save time and effort must be enforced in this external fashion. What we do is to take away from the child responsibility for working out his own reactions, and allow him to substitute our will for his. He knows we will nag him into action. We will make the effort for him, see that he does what is required. It is perhaps well enough to save the child's energy in supplying the will for forming such habits as airing the bed, brushing the teeth, washing ears, folding napkin, etc. This is pure habit-training and saves his strength for other things. While it is absolutely essential for the child to have such training, it is not education from the inside. The more the child can help to form his own habits, the better. Even in this realm, responsibility of the adult should not be carried to an extreme. A little girl has the habit of announcing in the morning that she is not going to school. If this challenge is taken up by the parents she is relieved of the necessity of deciding for herself. They will see to it that she goes and she

can indulge her resistance freely. If they refuse to be alarmed and force the responsibility back upon her the wind is taken out of her sails. She is obliged to make her own decision and take the consequences.

Neither is the reward-punishment motive very educational. It too is external to the act which the child carries out. He needs to be doing things because of his own direct interest. Anything as external as compulsion, fear of punishment, or hope of reward, works only when the indirect stimulus is present. Remove it and the child is left without the motivation of the direct interests which would operate whether or not external forces were present. The child who studies simply because he is made to never becomes much of a student. The workman who keeps to his job because of the pay envelope will never be likely to increase it. The morality which is kept alive by fear of punishment or hope of reward or by the will of another is not more than skin deep.

METHODS OF DEALING WITH INDIVIDUAL CHILDREN

When one wishes to alter the behavior of a child, the first thing to do is to study the behavior and try to interpret it in terms of the previous history of the child, the kind of environment he has been reacting to, the first appearance and the development of the behavior, his own explanation of it, and the probable need it is supplying. If after careful scrutiny of all the facts it seems evident that what we have is a mere left-over of a pure habit reaction which has little significance for the child, then a sharp punishment may be a good way of shocking him out of this old behavior pattern, although not necessarily the only way. If, on the other hand, the relation of the behavior to a genuine need or desire of the child is apparent, some way must be found of satisfying this need. Repression will simply force it into other channels where it may not be so easily followed. You cannot kill desire, you can only alter the form of expression. If a legitimate outlet can

be provided the undesirable behavior can be permanently cured because it will no longer be necessary.

Joe is an Italian boy who has become the terror of the neighborhood. He is only twelve but he refuses to go to school and is fast becoming a gang leader. When Joe is induced after much effort to enter a special school which gives individual attention and considerable freedom of expression and variety of work, it is discovered that he resents deeply his language handicap and the fact that he must go in a class with little children. The public school judges Joe entirely by book knowledge. He is never given an opportunity to do in school the things he can do well. In the special school he is allowed to use his hands as well as his tongue and eyes. He finds that he is as good as anybody when he wields hammer and saw. He discovers that he can build and model and garden and play baseball just as intelligently as any boy of his age. All of his energy goes over into allowable activity. School becomes his greatest joy. He is a leader but not a delinquent. No amount of punishment, repression or bribery would have solved Joe's problem. All of these had been tried by the public school and the mother. The unused energy, the intense need to be superior somewhere, had to have expression. As soon as he discovered school activities which allowed him to satisfy these normal desires he abandoned without effort the violent anti-social behavior which had reduced his mother to despair.

Anna was considered the worst child in the orphanage. She had a terrible temper, she was hostile and domineering with children and matrons, and she stole anything that came in her way—food, trinkets, small change, clothes. She was removed to a small observation school in the country where there were nine or ten difficult children with a teacher who did not believe in repressive methods. She was given complete freedom for a time. At first she seemed to be quite wild from the sudden release. She had a few tantrums, but was much

ashamed of them. She grew deeply attached to the teacher and was eager to win her approval. She was told that her habit of taking things was very human but ought to be broken as soon as possible. It was not suitable for a girl of her age, but belonged to early childhood. She would not be punished if she indulged it but she must try to be frank about it. The child was given many ways to express her strong driving impulses. It was found that she had good ability along several lines. She loved to manage people and things. She was given scope for her desire to dominate. She was sent later to a school where she found abundant use for all of her energy and ability. The temper was brought within bounds although it has always broken out occasionally under stress. The stealing habit has disappeared completely as if it had never been. Repressive measures had been used to the limit with this child and had failed because the needs which the stealing satisfied had never been met by the environment of the orphanage.

The new psychology of behavior tells us that the only way we can educate or reform is through the desires, needs, interests of the individual. They must ultimately be expressed in some form or other. They cannot be destroyed without destroying life itself. It is just a question of whether there is enough intelligence brought to bear to work out legitimate ways in which the actual desires of the organism can find outlet. Energy has to go somewhere—if not forward, then back; if not out in the open, then by some underground channel. The teacher may force the child to look at his book, but she cannot prevent the wish from fulfilling itself in a day dream. She may by fear or bribe induce the child to learn an arithmetic table, but she cannot, unless she engages his real interest, prevent his forgetting it the moment the examination is over.

EDUCATION FOR THE STONY PATH OF DUTY

"But," says the Puritan, "must we not teach our children to do things they do not like? Must we not prepare them for work, for the hard things of life? How shall we teach the supremacy of duty if they are always to follow their own interests?" There is only one answer to this. It does not silence the incorrigible New England conscience, but it is good psychology. The greatest motive power in the world is desire, interest. If once engaged it will work the individual as no indirect stimulus ever can, because his entire attention, his whole heart, are in the process.

Who works hardest, the man who hates his job and resists it at every turn, forcing himself through the long hours, or the man who loves it so he can hardly go home at night? The man who is expressing his own deepest interest, works for the work's sake. Work is play to him, and in consequence he spends himself freely. No one ever produced a marvelous invention, a beautiful picture, a great idea, under external compulsion. Hard work is the product of intense need or interest. It is for the end we set up, our heart's desire, that we surmount all obstacles.

When the child finds a school which can educate him through his own spontaneous driving interests he will not need to be compelled to work at his lessons. The difficulty with most schools at present is that they substitute for the interest and desire of the child the energy and purpose of the teacher to get over so much reading, writing and arithmetic. Schools should be planned in terms of what the child most needs to work out in relation to a real world. At present they tend to express the system in which teachers and principals can most easily function.

BRUSH YOUR TEETH AND SAVE THEM

HAY FEVER

SOME SUGGESTIONS FOR SEASONAL SUFFERERS

During the late summer and early autumn in North Carolina a great many persons are afflicted with hay fever. There is no section of the State absolutely free from the disease at certain seasons of the year. In order to prevent attacks from this disease, preventive measures must be instituted early. The first and most important thing to do is to discover the particular cause of the attack in each individual patient. Any person who suffers from an attack of hay fever can prevent attacks of the disease by finding out what happens to be the specific cause, and therefore avoiding infection. The following article, quoted from the Health News Service of the New York State Department of Health, affords valuable information concerning this disease, which will be useful to every sufferer from hay fever:

"From statistics gathered by the American Hay Fever Prevention Association it appears that about one per cent of the population are yearly affected with hay fever. Just why some people get the disease while a majority escape is not known. Some experts claim that sensitiveness to certain pollens increases with the lowering of a person's vitality. Whether this is so or not, it is probably true that nasal obstructions or malformations predispose to the disease.

"Before discussing the method of treatment we should first consider some of the causes of hay fever. True hay fever is due to a peculiar sensitiveness on the part of some persons to the pollens of certain grasses, weeds, plants or trees. Formerly, it was supposed that the pollen of the golden rod and rag weed were alone the cause of hay fever, but now we know that while these two cause some cases many other pollens are also to blame. As a matter of fact the pollen of golden rod is heavy and therefore is not widely scattered.

"The earliest group of cases of true hay fever develop in the early spring, are very few in number, and are due to the pollen of certain trees such as the birch and maple. The next group appears by the middle or end of May and lasts until mid-July, and is caused by grass pollen, while late hay fever begins in mid-August and lasts until frost. Rag weed is to blame for the great majority of late cases which constitute over 70 per cent of the total number. Rag weed should be eradicated wherever possible. The pollen of the different grasses is responsible for a great majority of the cases. Occasional cases are caused by the pollen of daisies, asters, sweet clover, corn, plantain, and far less often by that of other flowers and plants.

"What has been said applies to hay fever that occurs only at stated periods of the year. Many cases called hay fever that appear at odd times throughout the year and certain types of asthma may be due either to the presence of adenoids or to other nose obstructions. Such cases may also result from the sensitiveness of such persons to certain substances such as dandruff from horses, dogs, cats or other animals, dust from feathers used in pillows, hair used in mattresses, etc., cotton, insecticide powders, and orris root used in talcum powders and as a hair shampoo. Asthma may also be caused by the use of certain foods to which these particular persons are sensitive. Eggs, strawberries and some of the cereals sometimes cause this trouble.

"In hay fever coming at practically the same time each year, a fairly accurate guess as to the cause can often be made by noting the particular grass or weed or flower pollen most common at that time. In hay fever or asthma occurring at odd times during the year, it is wise first of all to have a competent physician examine the throat and nose for any

obstruction in the upper air passages. If none can be found there, it should be noted whether the attack is preceded by contact with certain animals, absence of which gives relief. In many cases asthma may come from the presence of cat hair or dog hair in the dust of the house, actual contact with the animal not being necessary to bring on an attack. It should next be noted whether the patient is free from symptoms when away from home. If so, then experiments should be tried to determine the exact cause by substituting hair for feather pillows, cotton for hair mattresses, etc. Women and girls afflicted with either hay fever or asthma should be careful not to use talcum powders containing orris root. Note should also be made as to whether the symptoms always appear after eating certain foods, such as those previously mentioned and others known to affect some persons unfavorably. In hay fever due to pollens the eyes should be protected by goggles when one is exposed as in walking in the fields or automobile riding, for the pollen often reaches the nose from the eyes through the tear duct.

"If these suggestions all fail, a physician can oftentimes decide definitely what is causing the trouble by inoculating into the skin of the arm minute amounts of a sterile extract of each of the pollens and other such materials as might produce the symptoms. No discomfort is felt

until the substance actually causing the trouble is injected when a slight swelling, reddening and itching occurs. Once the right substance is thus detected, relief from the affliction can usually be obtained by weekly inoculations of increasing doses of an extract of the substance in question, thus causing the body to manufacture its own antidote.

"You will be interested to learn what results may be expected from taking the treatment which has been indicated. One specialist has reported that of over 1,700 cases treated by him 25 per cent were entirely relieved of their symptoms, 50 per cent more were sufficiently improved so that they could attend to their work, and were quite comfortable, 15 per cent were only slightly relieved, while 10 per cent were not benefited.

"The results of treatment are said to vary with the strength of extract used and the intelligence of the patient in carrying out instructions. As a rule it must be repeated each year. Many patients show a tendency toward a recurrence of the disease in succeeding years, necessitating other courses of treatment. Some people seem to outgrow the disease. At all events, the treatment, even if it does not permanently cure the disease, at least serves as an alternative for the former necessity of seeking a hay fever colony or taking an ocean trip."

SAFETY FIRST

Every parent can do three definite things toward the protection of the child's health.

FIRST: Have the child immunized against diphtheria by having administered three doses of toxin-antitoxin.

SECOND: Take no chances on typhoid fever. Inoculation with anti-typhoid vaccine is safe and sure.

THIRD: Protect against smallpox by vaccination.

DIPHTHERIA

CAN BE PREVENTED BY

TOXIN-ANTITOXIN

Safe -:- Simple -:- Sure

This is Not an Experiment.

It Has Been in Use for a Number of Years.

Over 25,000 Children in North Carolina Have Been Immunized in the Past Three Years.

All Good Physicians Are Either Giving the Treatment or Advising that Parents Have Their Children to Take This Protection Against Diphtheria.

There Are No Unpleasant After Effects.

TOXIN-ANTITOXIN SHOULD BE GIVEN TO CHILDREN
BETWEEN THE AGES OF
SIX MONTHS TO TEN YEARS



SEE YOUR PHYSICIAN OR HEALTH OFFICER



TOXIN-ANTITOXIN is distributed through physicians by the Laboratory of the State Board of Health at the nominal charge of ten cents per treatment, or three doses which are to be administered at intervals of one week.

TOXIN-ANTITOXIN is to PREVENT diphtheria, as typhoid vaccine prevents typhoid fever. Antitoxin is to CURE diphtheria when it occurs in a child who has not been rendered immune to the disease. Literature on the use of TOXIN-ANTITOXIN and ANTITOXIN will be sent upon request.

DAILY HEALTH GUIDE



UP SMILING
No loitering in dressing or chores



RECESS
Play hard.
Put nothing dirty in your mouth.



EARLY TO BED
12 hours sleep for young children, ten for all others

ISSUED BY THE NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS, 105 E. 22d ST. NEW YORK.

FOR BOYS AND GIRLS

MORNING

Brush teeth—Toilet

BREAKFAST

Fruit, cereals and plenty of milk, eggs, bread and butter
No coffee nor tea at any meals
Eat slowly, walk to school. (Don't run.)



A GOOD WASH
Before breakfast.
Brush your teeth.

SCHOOL GOING and COMING

Take ten deep breaths slowly, shoulders straight and head up.
Don't sneeze near another person.
Use your handkerchief. Don't spit.



FRESH AIR
Study hard.
Sit up straight at your desk.

NOON

Wash your hands and face; use soap.
Glass of water before eating

DINNER

Besides meat and potatoes, or rice, eat plenty of vegetables and only plain puddings or fruits.

Chew each mouthful thoroughly.

AFTERNOON

Walk slowly after eating. Keep cheerful.
Play out of doors after school.

EVENING

Wash Face and Hands. Glass of water

SUPPER

Plenty of milk and fruits and fish or eggs instead of meat.

Fried foods are hard to digest.



GLASS OF WATER
Brush Teeth.
A hot bath twice a week

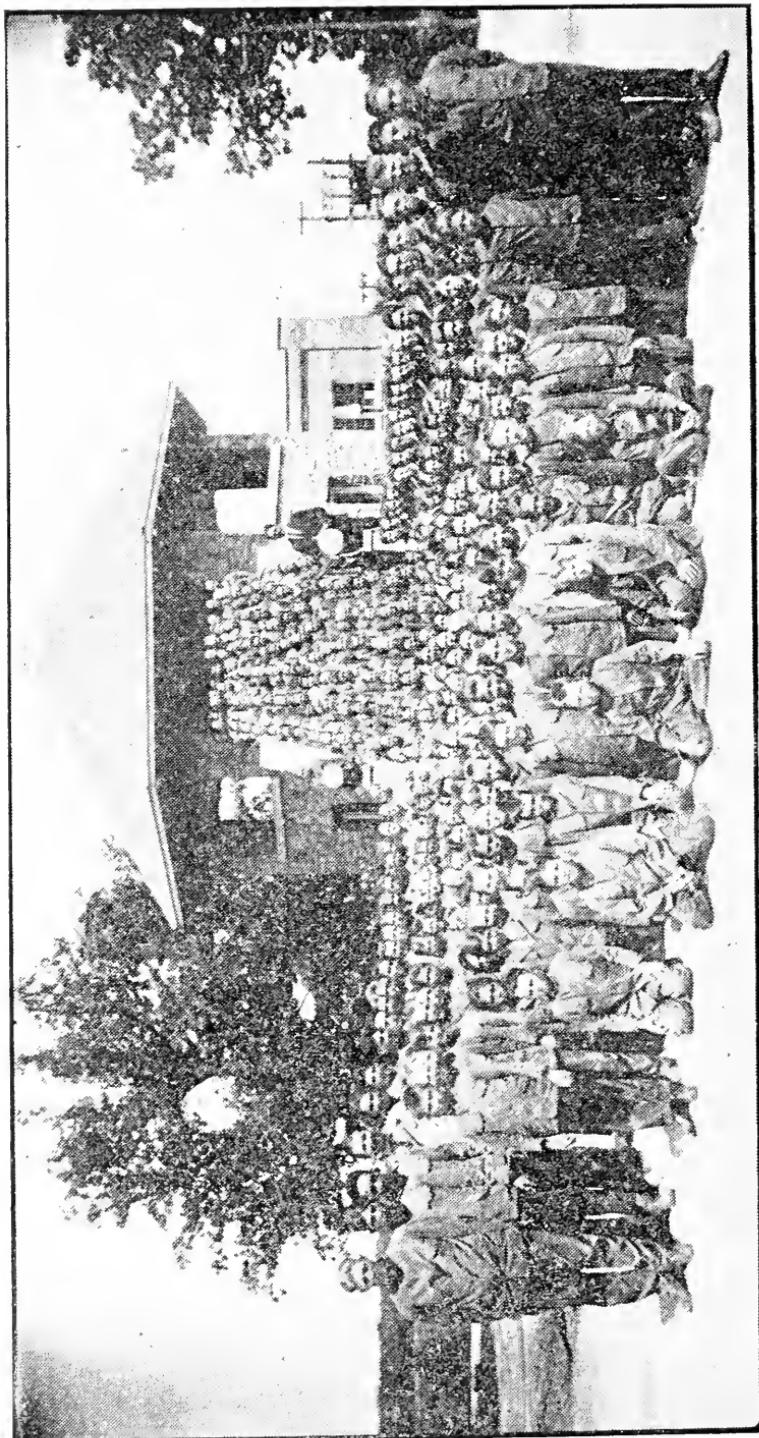
WINDOWS OPEN

Top and bottom

SLEEP OUT OF DOORS WHEN YOU CAN.

Adapted by the National Tuberculosis Association from the "Daily Program" chart of the Wisconsin Anti-Tuberculosis Association.

Is there a "Daily Program" hanging in your school room?
If not, why not?



GROUP OF BOYS AT JACKSON TRAINING SCHOOL

This institution, located in Calaveras County, near Concord, is accomplishing a remarkably valuable work for the State. A dentist from the State Board of Health during July conducted a clinic for the boys. Tonsil clinics have been held twice.



The Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

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No. 10

MUZZLE THAT COUGH AND SNEEZE



The season approaches when "bad colds" will become more or less prevalent throughout the State, affecting both adults and children. The latter are especially susceptible, and the fact that they are so closely associated together in large numbers in the school rooms means rapid spread of the infection when once started. Colds, and all the diseases of the respiratory organs, are spread by the discharges from the nose and mouth. The spread of these diseases can be largely controlled through two simple measures of personal sanitation. Always cover the nose or mouth when coughing or sneezing; and keep the hands clean.

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FREE HEALTH LITERATURE

The State Board of Health has available for distribution without charge special literature on the following subjects. Ask for any that you may be interested in.

WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SPIT PLACARDS	ADENOID
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
TUBERCULOSIS	EYES	TYPHOID FEVER
SCARLET FEVER	FLIES	DIPHTHERIA
INFANTILE PARALYSIS	COLDS	PELLAGRA
CARE OF THE BABY	TEETH	CONSTIPATION
FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREAL DISEASES
TUBERCULOSIS PLACARDS	MALARIA	CATARH

FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The **Health Bulletin** is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for **The Bulletin** each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.

THE Health Bulletin



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"JUST A SLIGHT COLD"

Beginning about this season of the year and continuing on through the winter, probably one-half the patients who visit the average doctor's office seek medical advice for "just a cold." Even among people of more than average education and intelligence, the conviction has held that "just a slight cold" is a trivial matter and therefore not to be bothered about unless it "hangs on." As a matter of fact, the syndrome of symptoms which have been conveniently and ignorantly designated as "common colds" are always serious.

For the first two or three days it is often impossible for a physician to make a diagnosis between a "cold" and many of the serious infectious diseases, unless he has definite knowledge that the patient has been exposed to some such particular disease. For example, the initial symptoms of such serious diseases as smallpox, influenza, scarlet fever, measles and often diphtheria are identical with the symptoms presented by a patient having "only a common cold." Therefore, it is the duty of every patient, not only to others but to one's self, to take warning at the very first indication of an attack of coryza. In the first place, the only rational treatment for a "common cold" is absolute rest in bed for two or three days, beginning at the first onset of symptoms. In the second place, if the attack turns out to be some other disease, no other person has been exposed, and the patient's vitality is conserved from the beginning. Although epidemiology and vital statistics records tell nothing of the prevalence of "common colds," because the condition is not reportable and the mortality is nothing (no death certificate assigning "colds" as a

cause of death would be accepted), it is probable that more people suffer from acute coryza than from any other single ailment. If a campaign lasting all winter could be carried on persistently and intelligently, covering all parts of the country, there is no way to estimate the great saving in life that would certainly ensue by preventing the spread of many other serious contagious diseases, even such collateral diseases as tuberculosis. If the spread of "common colds" could be suppressed and held to a minimum for a period of one year there is no doubt but what the effect on the pneumonia death rate would be amazing. One of the chief predisposing causes of pneumonia is a neglected acute coryza which has not been regarded with sufficient concern to demand rest in bed until recovery is complete. Such a patient nearly always presents a history of having "gone on" with work and other promiscuous activities, necessitating exposure in crowded street cars, crowded, over-heated trains and theaters and so on. The mucous lining of the entire respiratory tract being inflamed and in an abnormal condition, thus becomes a suitable lodgment for virulent pneumococci. As "colds" are contracted from other persons, and as the contagion is probably most active in the beginning, that is for the first two or three days, if every person so afflicted would isolate himself by remaining in bed during this period, the spread of the infection could be controlled much better. To all persons who would ask for advice as to the best treatment for "colds," the State Board of Health would urge that the services of a good physician in each individual case is necessary if complications of a serious nature are always to be avoided.

GOLOSHES versus UMBRELLAS

By William Brady, M.D.

[Through his daily health talks in several hundred newspapers, Doctor Brady is probably doing more than any other man in America to disseminate sound, practical, common-sense information on health topics among the people. Therefore it is with peculiar pleasure that we publish this original article on a common subject, but in which information is anything but common.—Editor.]

Let's play school. I'll be the teacher and you folks just pretend you understand what I tell you. Of course I know you won't really understand, because so many of you have minds like plaster of Paris which has set and is no longer susceptible to impressions. But just pretend. The class will please come to order. Johnny Jones, you may rise and tell us what ails any one whose nose commences to run, who feels a little chilly and aches all over, who sneezes and snuffles and has red eyes and can't smell anything except maybe drafts, and talks as though it were early sprig tibe and maybe coughs a little and altogether feels like the ver—

"He's got a co—"

Fine, Johnny, fine. Now, then, Mary Brown, you may tell us how to pronounce what Johnny was just going to say.

"C-o as in core, and the accent on the eyes—cor-eyes-ah."

Coryza. Yes, that is excellent, Mary. And next, Philip Smith, will you explain how folks get coryza?

"Coryza, which in former times was erroneously called cold-in-the-head, is one of a score or more of communicable diseases which spread from person to person in the mouth-spray. This is an invisibly fine spray of moisture droplets given off from the nose and mouth when a person talks, laughs, coughs or sneezes without first covering the nose and mouth. When a person talks in ordinary conversational tone, the spray carries not quite five feet from his face. When he sneezes or coughs with his face unmuzzled or unmasked or uncovered with handkerchief or hand, the spray carries ten to twelve feet."

Philip, that is admirable. You're not going to get caught in the spray if you can help it, are you? But, alas, how many poor misguided mortals are caught in it all unbeknownst while they busy themselves trying to dodge drafts and reform the weather bureau!

But, come, now. Betty Blue: can't you explain briefly what makes this mouth-spray so dangerous?

"Yes, ma'am, some folkses talk so much they splash and spatter like everything, and if you haven't got an umbrella you're liable to get wet through and take your death o—"

That will do, Miss Blue. You may remain forty minutes after school. We'll ask Julia Glum to explain why the mouth-spray is dangerous.

"Yes'm, now, cht, the, now, the little drops of rain—I mean the drops of moisture have germs in them from the sore throat or the coryza or the stuff coughed up or sneezed out, and so when the droplets fall on the face or lips of another person the germs may get into his nose or mouth, and they're still pretty lively germs 'cause they haven't been exposed to the cold more'n a jiffy on the way over."

This is delightful. I'm proud of the class—excepting that dreadful Blue girl. Now we understand how the coryza runs through families, schoolrooms and whole communities of people, without regard for the season or the weather. Besides, there are a score or more of other communicable diseases which spread in the same way, Philip told us. Now I'm going to write on the blackboard a list of these diseases, if you will help me to remember them all. We'll call them

RESPIRATORY INFECTIONS CONVEYED IN MOUTH-SPRAY

Coryza
The grip
Tonsillitis
Acute sore throat
Septic sore throat
Laryngitis
Bronchitis
Influenza
Pneumonia
Tuberculosis
Measles
German measles
Mumps
Scarlet fever
Whooping cough
Chicken pox
Smallpox
Epidemic meningitis
Infantile paralysis
Diphtheria
Pneumonic plague

Some of these diseases may be spread in other ways besides mouth-spray. Septic sore throat or tuberculosis may be spread through milk from diseased cows. Smallpox is the only one of the eruptive fevers which we still think may spread through ordinary contact as well as through the mouth-spray. But in all these diseases the usual mode of spread, if not the only way, is through the mouth-spray. Of course it is always possible that flies may convey the germs of any of these diseases if flies are tolerated.

Now, then, the subject of our lesson, children, assumes much greater importance when we consider that at the onset or beginning of the illness or indisposition nobody can positively predict whether it is to be merely coryza or one of the score of other diseases in the list of respiratory infections. No, not even the doctor can tell with certainty what the development of an apparently simple coryza will be, for so many of these respiratory infections, such as measles, meningitis, diphtheria or infantile paralysis, may at first seem to be merely coryza. And even though the illness proves to be ordinary coryza—which lasts a few days—there are so many serious and dangerous complications or sequels,

such as sinusitis, gathering in the ear, mastoiditis, perhaps calling for radical operations to save life itself, that in fairness to ourselves and in justice to others, for safety first and health all the time, there is but one course to pursue when threatened with or coming down with anything like coryza, and that is VOLUNTARY ISOLATION AS A GOLDEN RULE OF HEALTH.

For example, let us suppose I, your teacher, feel myself coming down with some indisposition which I fondly believe is coryza. May I safely or honorably remain at work here in school with my class, provided the indisposition does not prove disabling? May any one, child or adult, coming down with any such illness, continue at his usual play or work, in contact with other children or adults, without endangering all who happen to come within the range of his mouth-spray? NO. It is nothing less than criminal negligence to expose people to the risk of even the simplest coryza, and therefore I, your teacher, must voluntarily isolate myself for the duration of the illness.

That doesn't necessarily mean I must stay at home or in bed in a room like a prison. If I have the moral courage to wear a suitable mask from the very beginning of my indisposition I may remain in school without subjecting anybody to any risk of catching whatever disease I have. That is isolation. Again, if it is possible for me to keep more than five feet from every one I meet or talk with, I will not spread my respiratory infection, whether it prove to be ordinary coryza, diphtheria, scarlet fever, or whatnot, unless I accidentally or vulgarly cough or sneeze without first covering my nose and mouth with handkerchief or hand. That, too, is isolation, as effective as solitary confinement in a prison cell as far as the spread of the disease is concerned. But how fatal a momentary forgetfulness might be, when some child thoughtlessly crosses the invisible barrier and enters the danger area, or when I thoughtlessly pass the time of day with a friend, spraying him with the

deadly though invisible mouth-spray. There is still another alternative, if I insist upon keeping about and at work or play when coming down with a respiratory infection and yet decline to wear a suitable mask, and that is the masking of all persons who come within my range. This is a kind of vicarious isolation which was attempted by the people in many cities at the height of the influenza pandemic, you will remember, but it affords protection only to those who consistently and persistently wear their masks, and that is a very small minority indeed.

The mask should consist of not less than ten layers of gauze or cheese-cloth having thirty-two threads to the inch, in a piece large enough to cover mouth, chin and nose, tied in place by means of strings or tapes over the ears and behind the neck. Such a mask catches the droplets of moisture which carry the germs of the respiratory diseases, and therefore prevents the spread of infection through mouth-spray in either direction. The mask must be renewed when it becomes soiled or wet, washed and sterilized by steam or boiling. And the wearer must take pains to mark the outside, so that the outside will not be turned inside when the mask is taken off and put on again, say when the wearer removes it while alone in his room.

A kind of self-isolation should be practiced by everybody at all times when any of the respiratory infections is prevalent or epidemic in the community. To that end, without becoming at all morbid on the subject, one should study to keep outside of the range of mouth-spray when meeting people in business or social life. If there is a distance of not less than five feet from face to face, one is comparatively safe from any such infection, unless somebody sneezes or coughs in one's face. Of course, closer approach is necessary under some circumstances. Even personal contact may be necessary, as in shaking hands. As a matter of elementary personal hygiene, the first thing one should do after such contact is wash the hands, and until

this can be done, one must study and practice to avoid bringing the hand unconsciously to the mouth, for there is always the chance of conveying to the mouth infection (germs) picked up in contact with other persons.

Now, Miss Betty Blue, we're going to give you another chance. Come to think of it, you may not have been so far wrong, at that, when you said folkses were liable to take their death if they got caught in the spatter without umbrellas. An umbrella would be the next best protection, I suppose, if one had no mask. Elucidate your meaning a little further, please, Miss Betty. Now, about sudden changes of weather, getting chilled after being over-heated, drafts, changing the weight or amount of clothing, leaving off your goloshes, and so on?

"Aw, shucks, that's the old hokum bunkem. Let it drop down the well. It doesn't matter about the weather or your goloshes or your winter-weight unmentionables, ma'am. Drafts and wet feet and damp night air and chilliness never injure anybody nowadays. Such things just cause discomfort. People really have no fear of such things any more, 'cept maybe some of the old 'uns, the folkses with solid plaster of Paris cocos. People imagined drafts and bad weather and night air were dangerous long ago, but that was before the doctors had discovered that these mouth-spray diseases are caused by germs. There's nothing but danger to health in the popular notion about "exposure." The only exposure we must guard against is exposure to the mouth-spray of persons having these germs, and so I say there's no telling what you'll come down with if you get caught in the spray without your umbrella."

Very good, Betty. Order to stay after school is canceled. It was only nominal anyway, for a teacher with due regard for the health of pupils never keeps any one after school.

The first six diseases in our blackboard list are more or less interchangeable, that is, the same germs may cause coryza in one person,

bronchitis in another, or sore throat or tonsillitis in another. All the others are specific diseases, that is, the germs can cause only one disease, be it measles or influenza. But remember, every one in the list begins with symptoms more or less like coryza or "just a cold," and so, unless the victim promptly and honestly isolates himself there is no telling what disease he may spread through the community.

We have learned only in recent years that most of these diseases, which are so likely to masquerade as "common colds" at the beginning and before their true nature becomes apparent, are most likely to spread just in that stage—the stage of onset or invasion, when the victim still tries to assure himself it is "just a slight cold," and persists in keeping about at work or play without any precaution against spreading his disease. This fact explains why so many epidemics light up in schools where "ordinary colds" are still deemed unworthy of serious consideration.

To call any illness or indisposition "a cold" is to attempt to conceal from yourself or from your associates the probability that you are harboring and perhaps spreading infectious disease among your friends. When a doctor so far forgets his duty to the public as to acquiesce in the deception that any illness is "just a cold," that doctor is making mischief by precept and example. The public, not the individual, is entitled to the benefit of doubt concerning the character of the illness in the stage before a positive diagnosis is made.

To call the trouble coryza, or sore throat, or bronchitis may prove to be an inaccurate diagnosis, for the illness sometimes proves to be measles or epidemic meningitis or infantile paralysis, but at any rate the diagnosis is honest and carries with it the implication that the trouble is infectious, and that in itself should be fair warning to everybody to

BEWARE THE SPRAY
MASK YOUR SPLASH
MUZZLE THE OPEN FACE
COUGHERS AND SNEEZERS.

SEASONAL HAZARDS

Weather and Disease

"Good morning, how are you this morning?" "Mighty poorly, under the weather," is a salutation and response as old as history in some parts of the world. The weather and its effects on the physical condition, the mind and the morals of mankind is a subject upon which scientists and fakirs, learned and unlearned, preachers and mystics, physicians and quacks, high and low, rich and poor, have for ages delighted to speculate. Although acres of books have been published in all countries ever since the discovery of printing, on the subject of the effect of the weather on disease, very little is definitely known. Medical writers all have a different point of view, and a different explanation for various phenomena. For example, one of the most excellent books on public health by a celebrated author, published in 1922, states that the weather and climate cannot have any effect on diseases like diphtheria. He says that diphtheria is just as prevalent in New Orleans as any of the Northern cities. Another fine work on public health by an equally celebrated author, published also in 1922, emphatically states that as diphtheria is practically unknown in the warmer climates of the subtropics and tropical countries, the weather must be to blame. One author says that cold, damp seasons of weather predispose to the disease. Another author is equally as positive in his opinion that prolonged seasons of drought and dry winds predispose to diphtheria. There is an equal diversity of opinion with reference to nearly all other diseases.

It seems to be a fact, however, almost universally agreed upon by medical authorities, that what we ordinarily call a "sudden change in the weather" if occurring any time from early fall to April is unfavorable to health. This is a fact if the drop is very sudden and exceeds 25 degrees. A sudden excessive rise in temperature seems also to be even more unfavorable to health. For illustration, it may be pointed out that

there are more sudden rises in temperature in the spring months and more sudden drops of the mercury in the fall months; and the average death rate is higher in the former than it is in the latter period.

Diseases like pneumonia, although found in virulent form in the tropics by Gorgas and others, have a definite mortality curve. As the temperature goes down beginning in the fall, the death rate from pneumonia rises accordingly, reaching its peak when the weather is at its worst.

Many people believe that the school is chiefly responsible for the spread of contagious diseases in the autumn. This is undoubtedly a fact, although it is doubtful if the weather has much to do with it. Some health experts undertake to argue that the age distribution does not prove this. Such argument is fallacious because, to be of any scientific value, the comparison would have to be made between children of school age and adults living only in families having no children in school. No such comparison has been made.

In Volume I of his fine work on "Epidemiology and Public Health," published by the C. V. Mosby Company of St. Louis, Doctor Victor C. Vaughan says, in a chapter on "Weather and Disease," that "It is not so much the cold weather that affects us as our semi-civilized responses to this cold. Outdoor cold drives us to live in over-heated atmospheres indoors. It is this fact which helps explain the apparent contradiction in the effect of weather on pneumonia. Huntington's charts of daily deaths and the rise and fall of temperature indicate that a drop is favorable to a lessened mortality. On the other hand, it is during the cold season that pneumonia is greatest. Physiologically, cold is stimulating, heat is depressing. Practically, cold weather places a greater strain on the body in metabolism and in waste elimination. The body is more exacting. Working under a heavier schedule, it must not be denied its rest. If given a chance—ample sleep, living in cool rooms—the body responds to the stimulation of winter.

"It is said that tuberculosis patients do much better in the cold season. Sick people so care for themselves as to counteract the unfavorable concomitants of cold. Arctic explorers are not prone to pneumonia. It is thus the habits of life which cold weather induces, rather than the weather itself, which leads to pneumonia. It is for this reason that we may regard much of the pneumonia as humanly preventable.

"That overheating indoors measurably weakens health is well brought out in the studies of the New York State Commission on Ventilation. Slight overheating (75 degrees) increases heart action and body temperature. It reduces the inclination to do physical work. It brings on fatigue prematurely. Miller and Cocks report that workers in warm, moist atmospheres, such as laundries, exhibited atrophic rhinitis in 46 per cent of all those examined. Among workers in hot dry atmospheres, boiler-room men, stationary engineers and the like, 35 per cent were found with atrophic rhinitis. Among outdoor workers, drivers, teamsters, postmen, etc., the percentage was 19. Among young college students it was 3 per cent. These same authors show that exposure to heat causes swelling of the turbinate bones of the nose, an increase in secretion and redness of the mucous membrane."

Some Possible Uses of a Better Understanding of Weather Disease

"The study of weather and disease is a fascinating pastime, but we hear the voice of the skeptic asking what use we expect to make of the knowledge gained. The weather is given to us. We cannot change it. If we are dissatisfied with a climate, we can move elsewhere, but as for neutralizing bad weather, it is out of the question.

"It is true that we cannot alter the outdoor weather, but we can alter our habits of life and our indoor environment if it is proved worth while. The practical value of an accurate understanding of weath-

er and disease lies in its application to ventilation of buildings and the treatment of sickness. It has been pointed out to us that cool variable temperature with somewhat high humidity is best for health. We have the partial verification of this conclusion in a study of respiratory disease among New York City school children, as reported by Baker and more recently by Palmer. Records were collected of 5,000 school children distributed in three types of ventilated rooms. One group occupied cold open-window rooms, the temperature averaging around 59 degrees. Another group was in window-ventilated rooms at a higher temperature, between 64 and 67. The third group was in fan-ventilated rooms, whose temperature ran quite uniformly from 68 to 70 degrees. Off-hand we would say that the children in the cold rooms were risking their health at such low temperatures. Again we might think that the children in the fan-ventilated rooms would be better off because of more complete air circulation and hence chemically purer air. The result is quite different. Colds were most frequent in the warmer, more uniform fan-ventilated rooms. They were least in the mild window-ventilated rooms, but the difference between this and the cold-window rooms was negligible. This study suggests a method of attacking pneumonia, namely, by accustoming ourselves to rooms of low variable temperature. By so doing we reduce the extremes in temperature. It is this hardening process which the body needs in order to maintain a vaso-motor tone sufficient to counteract the depressing effect of the winter season. The morning cold bath exerts a similar action, namely, that of keeping the skin in training to cope with temperature changes.

"These studies have shown that pneumonia increases as physical vitality decreases. When this fact is fully sensed we shall adopt the habit of easing up in February, resting in order to counteract fatigue. A week's rest or vacation or shorter hours of labor at this season will be the means by which this may be brought about.

"We are spending our winter days in temperatures between 70 and 80 degrees. Houses are overheated, theaters are overheated, offices and stores are overheated. Happily the temperature of schoolrooms is gradually being reduced. This situation continues because the unfavorable effect of warm rooms on health is not widely sensed. When the machinery for popularizing the relation of weather to disease is better organized, we shall begin to take advantage of this knowledge, and then may we expect a reduction in the pneumonia toll.

"If low humidity is bad and high humidity is good, as Huntington believes, we shall adapt this fact to building ventilation. Some day we shall understand how best to utilize the air environment in warding off other diseases as well as pneumonia.

"In addition to preserving health by taking advantage of the optimum air conditions indoors, we shall utilize the weather-disease relationship in restoring health. It is within 50 years that Trudeau demonstrated the value of the open air in the treatment of tuberculosis. Now our cities have special open-air classes for under-nourished and tuberculously-inclined children. Formerly great care was taken lest cold air reach a pneumonia patient. Now pneumonia is fought with cold air. Brooks used tents to good advantage in treating influenza patients in Massachusetts."

PUBLIC HEALTH ASSOCIATION

The fifty-second annual meeting of the American Public Health Association will be held in Boston, October 8-11. A program of unusual value to all interested in public health work has been prepared.

MEDICAL HISTORY

[Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.]

INFLUENZA

In influenza the world has a significant example of one of the strange medical paradoxes. It is a disease that has primarily caused the death of more people than any other disease in the world perhaps. The paradox is seen in the fact that influenza itself probably never kills, death being generally, or always, due to some complication, usually pneumonia.

Rosenau says that there have been about 80 epidemics of world-wide character since the 12th century. Since the year 1510 there have been many great pandemics, the worst one probably being that of 1918 and 1919 designated as Spanish Influenza, because it was first noticed in Spain and soon spread all over the earth. It is estimated that there were upward of 200,000,000 people who had the disease, and that over 10,000,000 people died in less than twelve months. Within six months time in the United States, 20,000,000 cases and 450,000 deaths occurred. It caused the deaths of thousands of healthy men and women in the prime of life. The increase in morbidity and mortality from numbers of collateral diseases was marked following the pandemic of 1918 and 1919. Even now deaths are frequently recorded in North Carolina, designating an attack of influenza as the chief contributing cause. Influenza attacks all races, ages and both sexes. It seems to have a predilection for young and healthy people, the greater mortality in the last great epidemic being among the age group between 20 and 30. With one or two exceptions, perhaps, there is no disease which attacks indiscriminately such a large proportion of the whole population as influenza. When an outbreak in a community occurs, the disease attacks individuals with

swift and sudden fury. Influenza occurs at all seasons of the year. The disease ordinarily spreads from east to west. The disease is conveyed by human contact independent of climate or the prevailing direction of the wind. While the disease spreads with amazing rapidity, it has not been proved that it ever outstrips human travel.

As is the case with diphtheria, acute coryza and other diseases, one attack not only does not confer immunity except for a short period of time, but would almost seem to predispose to another attack through lowered vitality, the existence of complications and lessened resisting powers. No other disease is more demoralizing to the ordinary life of a community because so many people are attacked at the same time, owing to the short period of incubation and the highly infectious character of the disease. Travel and ordinary business activity is paralyzed within a remarkably short time. There is always an extreme shortage of doctors and nurses; and hospital facilities, in this State always inadequate, are entirely unable to cope with the disease. Carriers may spread the infection but this is not definitely known.

History of One Mild Case

A married woman, wife of a physician, having three children living, attended a large gathering of teachers from all over the State, which took place in the town in which she lived. Within a few days she developed what her husband supposed to be an acute coryza. After a day or two in bed she apparently recovered, with the exception of a cough which persisted. The cough seemed intractable. Her husband consulted one of his medical friends. Seem-

ingly everything was done for the cough which could be done. But the cough got worse and the patient lost weight and strength. Ten weeks after exposure at the teachers meeting, in a violent paroxysm of coughing, a blood vessel in the brain ruptured and paralysis of the entire left side ensued. The kidneys were found to be badly involved and an acute nephritis present. After long weeks in bed, with careful nursing and strict diet, both lungs and kidneys cleared up. Motion slowly came back to the lower leg, but the facial paralysis and the helpless left arm

remain about the same after nearly two years.

The secret of the whole attack, of course, was that the apparent mild "cold" was an insidious, treacherous attack of influenza. The warning that such a story as this should give is it is never wise to treat a "common cold" lightly. And a persistent cough that does not get better in two or three weeks should be sufficient cause to put a patient in bed and to demand a most careful examination by a capable physician, of heart, lungs, kidneys especially, and an accurate blood pressure reading.

EARLY IMPRESSIONS

By Average Asclepius, M.D.

There is no truer maxim than the observation that early impressions are lasting. One such impression burned itself into my mind which has been well-nigh impossible to eradicate. One morning, at the breakfast table, when I was about eight years old, my father came in from an all-night vigil at the bedside of a neighbor, and quietly made the solemn announcement that "Billie is dead." Billie was a neighbor farmer, the head of the family and the father of several small children, thus orphaned early in life. But the impression that stuck was the further pronouncement by my father that the cause of Billie's death—struck down in his prime—was pneumonia, and that he had contracted it by plowing all day a few days previously in a cold, misty, late spring rain. So, getting wet might mean pneumonia and death. For twenty years no amount of argument would have convinced me that anything except "cold and exposure" could cause pneumonia; and, what is worse, the teaching later in the medical school—a Class A school, too—which I attended, soft-pedaled the infectious nature of the disease, but went into "high" when teaching how dangerous "exposure and cold" were as predisposing causes to the disease.

About this time (1884), Fraenkel, following up investigations made by Pas-

teur and Sternberg, determined that a particular germ, known as the pneumococcus, is the specific exciting cause of pneumonia. However, a lot of people do not know this yet, after forty years wandering in the wilderness, Osler has said that from 80 to 90 per cent of healthy people have the pneumococcus present in their mouths. Some persons always harbor all the time a virulent variety of these germs, and, what is worse for the public, the presence in the mouths of such people of these virulent "colds" is a much greater menace to other and healthy people than they are to those individuals.

"WET FEET" AND "DRAFTS"

Although it has been repeatedly proved that such a disease as pneumonia, or as coryza, does not exist in the vicinity of the polar regions, the coldest place in the world, because the germs which produce the disease do not and cannot exist there, a majority of people are still firm in the belief that "cold" causes pneumonia. The real situation is simple and easy to understand. Say, for instance, I go to church on a cold day and take a seat at the end of a pew near a window which the sexton has very properly left lowered at the top, and the house is crowded. I have just left a "good

and warm" sitting-room at home. Soon I begin to feel chilled and commence looking around to see how my fellow-sufferers are taking the unaccustomed "air." Just about the time I crane my neck around to the proper angle, a fellow three feet down from me, who has also left a "good and warm" room, turns to meet my stare, and greets me with a forty-horse-power sneeze. Now, suppose he is one of the people who is furnishing free mouth rent to about a billion virulent pneumonia germs, and he sprays my defenseless face with a large proportion of his supply, which, however, he does not miss, because his quota is being constantly replenished. I go home, firm in the conviction that my "bad cold" next day is due to the draft through the church window, and if I develop pneumonia and die, I march out to the tune of a chorus of curses heaped on the head of the helpless sexton by the righteously indignant family and neighbors, for his criminal action in allowing a draft in church.

In the first place, if I, and the fellow shooting the pneumococci barrage, did not have our homes overheated, the change to a different temperature out of doors and at church would not be so marked; and in the second place, if we both, and especially the germ-laden sneezer, would mask our noses and mouths behind a large handkerchief while sneezing is going on, I might live on for a while and die a natural death from worry or bad teeth, instead of from pneumonia caused by a draft. But I have been told all my life that wet feet and cold drafts cause pneumonia, and if I can't hold on to some of my fine old early impressions, what is the use of living, anyhow?

IN THE WRONG PLACE

Last winter a department nurse reported from a fine Piedmont county that she was enjoying her work, except for the fact that she was finding the schoolhouses for the most part overheated and "colds" epidemic everywhere. As I read the report, I made the mental note that Miss H. is probably getting too fat. However, before completing the report, my opinion

underwent a rapid change. That particular nurse, being a devout Presbyterian, attended church services on her first Sunday in the fine little county-seat city. But, as if to emphasize her criticism of school heating, she stated that she had to leave the church before services were over, because the building was so hot she could not get breath. She later complained to some of the church officials, in the course of explaining why she had left the services, and was told that the church had to be a bit overheated, so that several elderly ladies, who rarely went out anywhere else, could attend services. The nurse laconically added that "Actually some people are liable to get in the wrong place hereafter and not know it—sort of a homelike temperature." And contagious disease germs of all kinds do thrive in a hot atmosphere.

DISEASE SPREAD BY PERSONS AND NOT BY THINGS

It is, therefore, easy to understand that in the autumn, when schools open, when vacationists return, and the pure outside air is shut out and not given a chance to dilute and kill off infection; when the disease carriers or even some sick people mingle with the well in poorly ventilated schoolrooms and other places, then the ball begins to roll. The doctor's telephone bell begins to go crazy, the druggist discharges his extra cold-drink dispensers and takes on another prescription clerk, and Mr. Public pays the bills and suffers as usual.

You ask, what can be done about it? What is the remedy? How can erroneous early impressions be corrected, and how can correct impressions be ingrained into the minds of our growing children? In other words, how can the truth be made to prevail? Frankly speaking, I don't know. After twenty-two years devoted to the intensive study of medicine, to the study of disease, its cause, cure, prevention, and control, the only advice I can offer is that every pupil, from the primary grade in school to the senior class in medical college, should be taught, in season and out, the truth as to the nature, spread, prevention, and control of the ordinary contagious diseases.

It is probable that the high death rate from pneumonia is due, in part at least, to the failure of the people to grasp the full significance of the fact that it is a disease caused by a particular germ.

HOME ORCHARDS AND CHILDREN'S DIET

Writing editorially in the Progressive Farmer on what he saw on some recent trips in North and South Carolina, Doctor Clarence Poe says:

"The home orchards seen in ten South Carolina and twenty-three North Carolina counties are as a rule noteworthy only on account of their neglect. The one exception was found in some of the home orchards in the Sandhills. There the example of the commercial orchardist is reflected in some home orchards. Do most of our cotton and tobacco farmers care nothing for fruit? Is there lack of knowledge of the food value of fruit? Why is it that we are so neglectful of our home orchards—and of the diet of our children?

"The average home garden even in June and July is less than half efficient. This statement is not made on the basis of an ideal garden but after seeing many hundreds of gardens from low to high degree. It is an estimate reached by comparing all gardens seen with the best ten in a hundred. We believe more good gardens were seen between Columbia and Anderson, S. C., than in any other equal distance traveled in the Carolinas."

It is a fact that growing children should have apples and some form of vegetables, fresh if possible, every day in the year. There is not a farm in North Carolina but what is capable of furnishing an all-year-round garden, affording some form of fresh vegetables every single day in the year. Such fruit as apples and peaches are less sure, owing to the hazards of frost. But if all farms were stocked with a few late apple trees of a healthy, prolific variety, and then properly sprayed and attended, every family table in the State could be provided the year

round with a home-grown product. The same thing applies to the question of a garden. If the same attention were given to a garden on every farm that is given to tobacco, cotton or other "money" crops, there would not be any necessity for importing another can of foodstuffs into North Carolina. With the easy availability of milk, fresh home-grown fruits and vegetables, the dietary of every home in the State would then afford the best it is possible to secure for growing children. Add to the above dietary, home-raised honey, wheat sufficient for home consumption, and all animal meats, including fish and poultry, necessary to supply the State-wide demand in every home, and our State, with its advantages of soil and climate, would never again have to ask "for something to eat" away from home. The money thus paid by townspeople in the State to our own farmers for foodstuffs, which is now paid to outside agencies, would in two years time provide every family with an automobile, and every man, woman and child with a bank account. And of vastly greater importance, all the children of our State would be provided daily with a suitable health-building diet.

SMALLPOX

Smallpox is always more prevalent and much more severe in North Carolina during the winter months. The time to control the disease and to prevent its spread is through successful vaccination before schools open.

A recent report sent out from Arizona states that during the past five months in that State ninety cases of smallpox were reported to the State Board of Health, with twenty-six deaths.

For the past two or three years reports from various sections of the country prove that the disease now is of unusual virulence and accompanied by a very high mortality. Even in the mild form the disease is often followed by serious complications, especially in cold weather, be-

sides, it is one of the filthiest diseases with which mankind has ever been afflicted. For a person to deliberately risk an attack of smallpox with its possible fatal complications and its certain marking for life, through pretended fear of vaccination against it, is simply confessing to being a fool.

The adult crank who refuses vaccination is free to do as he pleases so long as he does not subject other people to the consequences of his own folly; but children should be protected against the disease before entering school for the first time at about six years of age.

The best rule to follow is to vaccinate all babies at six months old and again at six years. Neither vaccination bothers them but for a few days, the general symptoms are always over within a few hours, the scar soon heals, and they are protected for life against the disease in severe form at least.

And remember, that the Laboratory of Hygiene of the North Carolina State Board of Health provides a clean reliable vaccine FREE of charge to any citizen of the State requesting it through his family physician or health officer.

CONCERNING DEATH CERTIFICATES

It is seldom that the State Board of Health publishes a list of deaths assigned to specific causes, designating the counties from which such reports have been received; but it sometimes becomes necessary to do this. Such was the case in presenting to the public the material facts concerning deaths from malaria in North Carolina, which was fully discussed in the August issue of the Health Bulletin. It was carefully stated at the time the figures were published that a few deaths had been reported from Piedmont counties and that such deaths were in nearly all cases due to imported labor being responsible for the introduction of malaria into such localities.

On reading the August issue of the Bulletin Dr. Parks M. King, of Char-

lotte, who is one of the most responsible and painstaking physicians in North Carolina, wrote us a letter concerning the deaths which were reported from Mecklenburg County as being caused from malaria. Doctor King, in his letter, has not only made a sensible criticism of the difficulties against which the State Board of Health has to procure accurate vital statistics records, but he has offered a very practical recommendation to overcome this difficulty, which would be applicable not only to Charlotte and to Mecklenburg County but to all other places in the State. Doctor King has kindly consented for us to publish his letter, together with the reply of the State Board of Health, in order to interest all other doctors and health officers throughout the State in this important question.

Doctor King's Letter

"I looked over the Health Bulletin for August with a great deal of interest and note that Mecklenburg County had five colored deaths from malarial fever in 1922. Some years ago Dr. Wm. Allen, in looking over the death reports for the preceding year, found that there had been fourteen deaths in Charlotte from malarial fever; thirteen of these were reported by one negro doctor.

"It is only on rare occasions that I see a case of malarial fever, and usually this has been imported into the county. Undoubtedly these five deaths were all due to tuberculosis. I had a talk with our health officer, Dr. McPhaul, and the same condition is true in regard to typhoid fever. On Saturday he showed me two death certificates diagnosed as typhoid, which were evidently not typhoid. He advised me that a few days ago he had a death certificate marked typhoid fever. He had seen this patient one month previously, she having been bedridden with tuberculosis for the past six months. He called up the negro doctor, who told him that he had marked it typhoid in order that the woman could get her insurance, she having been recently examined and passed for insurance.

"I am very sorry to see this condition reported, and I know the diffi-

culty that you are having in getting correct reports. I have spoken to Dr. McPhaul and at the next meeting of the county society in September I will ask the county society to petition the commissioners of Charlotte to require a blood culture by the health officers in all cases which are reported as typhoid fever. Personally, I have a large general practice and have not seen a case of typhoid fever in my own practice since before 1918."

Reply of the State Board of Health

"In the first place, we want to say that we would rather have the Health Bulletin read carefully each month by each of the twenty-three hundred physicians in North Carolina than by any other class of people, for the simple reason that more real, permanent, and lasting good could be accomplished in reaching the people through the profession; therefore, it is encouraging to know that an active practicing physician, with as many demands on his time as you have, finds time to look over the Bulletin. In the second place, we want to say that we fully appreciate your letter and your criticism, because your criticism is constructive, and you couple with it a definite plan for Charlotte, which would be equally as good a remedy for every other place to apply.

"You, of course, noted in reading the editorial on the first page of the August Bulletin that we made sufficient explanation that the few deaths reported from malaria from the Piedmont counties were irregular, and due probably to imported labor.

"You are not only right in your statement that we have difficulty in getting correct reports of deaths, but you also know that our rules and regulations must conform to the Federal census requirements, and not even the United States Government can question, or go behind, a sworn certificate properly signed by

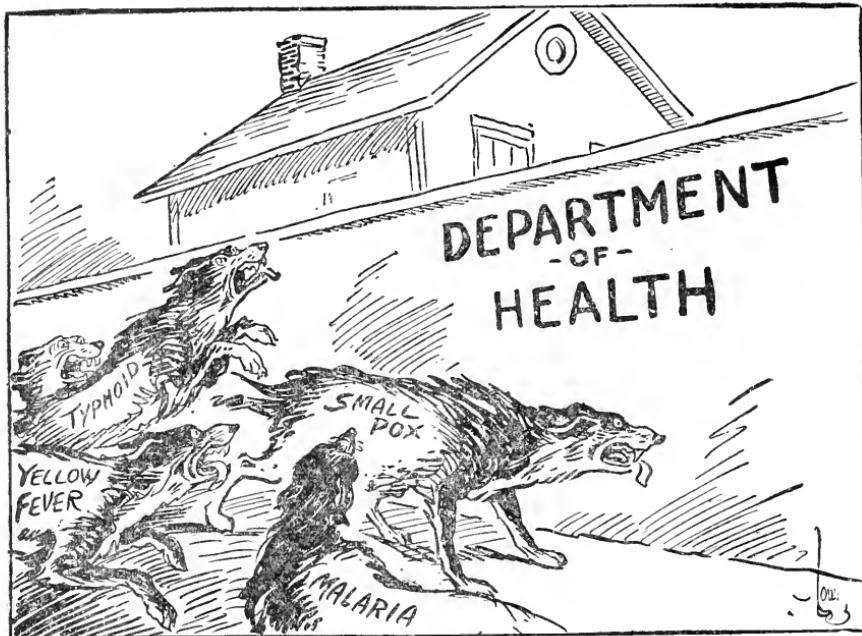
a licensed physician. So, the remedy you propose is certainly the proper one, for it is unquestionably one for physicians to remedy themselves, a matter of medical honesty."

THE NEW HEALTH EDUCATION

"The first idea that is often found at work in the health movement is that health is primarily a physical matter. This idea is predominant in the emphasis on brushing one's teeth, in the masticating one's food, and in exercising one's muscles. Contrariwise, health is not only physical, but also mental and social. One's teeth are more dependent on what one's mother eats during pregnancy than on teeth-cleaning habits; one's digestion is related as much or more to mental attitudes than it is to mastication; and exercise that neglects the satisfactions and annoyances in the nervous system is making false claims for wholesomeness. The teacher of health education must recite as one of the first principles: Mind and body are one. Health and happiness are not built up; they come from activities that produce them as by-products. The important consideration in this connection is to teach boys and girls to live correctly, to establish wholesome habits, and to form socially useful attitudes. The school, by its sterile program of calisthenics, may delude itself about 'building up health,' but boys and girls go to college seeking to be excused from the requirement of physical education. It is far more important that the school seek constantly to develop a skill in, and a love for, some form of physical activity that they will carry with them throughout life. In an article that is full of sound common sense, Dr. J. F. Williams, of Teachers College, Columbia University, in the September issue of *Hygeia*, makes the above remarks and brings home forcefully the need for interest and satisfaction in work and play if a real hygiene is to be taught."

TOXIN-ANTITOXIN PROTECTS AGAINST DIPHTHERIA

OUR HEALTH DEPARTMENTS MAINTAIN



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AN EFFECTIVE BARRIER AGAINST DISEASE

THE BULLETIN,
COTTLE HILL, N. C.



The

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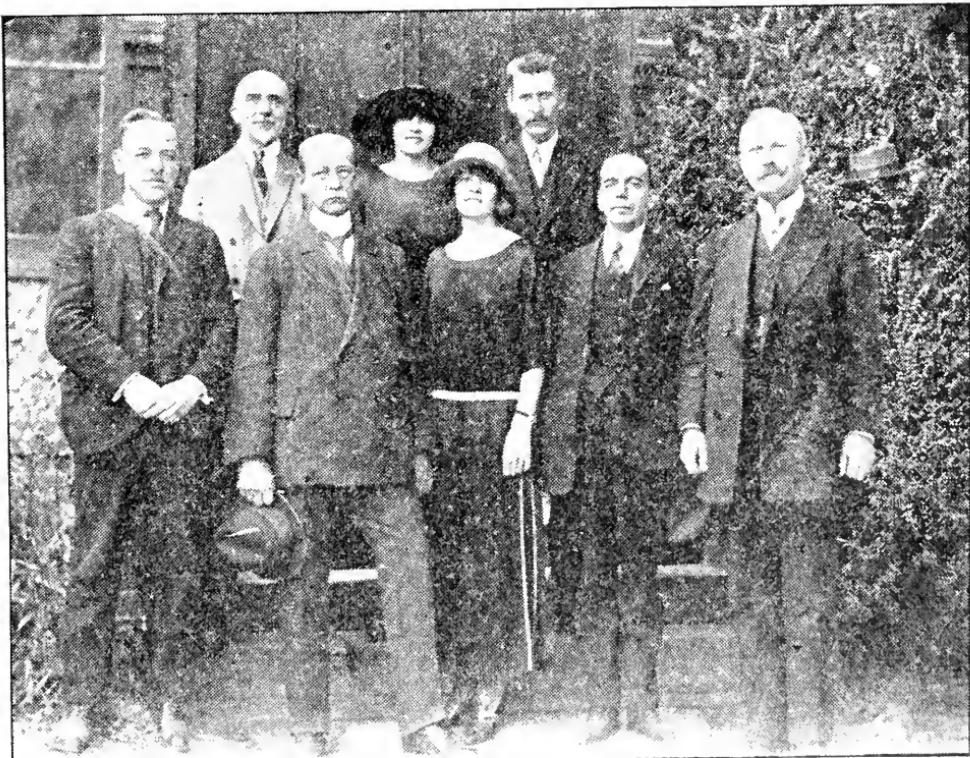
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FREE HEALTH LITERATURE

The State Board of Health has available for distribution without charge special literature on the following subjects. Ask for any that you may be interested in.

WHOOPING-COUGH	CLEAN-UP PLACARDS	SMALLPOX
HOOKWORM DISEASE	DON'T SPIT PLACARDS	ADENOIDS
PUBLIC HEALTH LAWS	SANITARY PRIVIES	MEASLES
TUBERCULOSIS LAWS	WATER SUPPLIES	GERMAN MEASLES
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FLY PLACARDS	CANCER	INDIGESTION
TYPHOID PLACARDS	PRE-NATAL CARE	VENEREAL DISEASES
TUBERCULOSIS PLACARDS	MALARIA	CATARRH

FOR EXPECTANT MOTHERS

The Bureau of Maternity and Infancy has prepared a series of monthly letters of advice for expectant mothers. These letters have been approved by the medical profession. They explain simply the care that should be taken during pregnancy and confinement, and have proved most helpful to a large number of women. If you want them for yourself or a friend, send name to the State Board of Health, and give approximate date of expected confinement.

THE HEALTH BULLETIN

The **Health Bulletin** is sent monthly without charge to all persons in the State who care to receive it. If you have friends or neighbors who will be interested, suggest that they write the State Board of Health, asking for **The Bulletin** each month. When you have finished with your copy, give it to some one else, thereby increasing its usefulness.

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HYGEIA

A New Journal of Public Health

Health officers and thinking people everywhere throughout the United States welcome with unalloyed satisfaction the publication of *Hygeia*, "A Journal of Individual and Community Health." This splendid new magazine is published by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. The price is three dollars a year. *Hygeia* is edited by a group of very able men; and its special articles are contributed by people who are able to speak with final authority on the subjects about which they write. The editorials, special articles, and other matter is simply and clearly written and easy for the lay reader to understand. This journal enters a field in need of cultivation. In other words, its most important appeal is to the physician in private practice. This is so because the physician can毫不犹豫地 recommend it to his patients as well as read it with profit to himself. Supported and sponsored by the great American Medical Association, the most powerful and influential organization of medical men in the history of the world, it is needless to say that there can be no question as to the accuracy, sanity, and sound scientific value of its contents. The current issue each month should occupy top place on the reception room table of every physician.

Commencing publication at a time when the very news stands are cluttered with inane, meaningless, senseless stuff, and when faddism is running rampant, all in the sacred name of health and physical development, *Hygeia* should be given the whole-hearted support it deserves by the medical profession and the public.

DIPHTHERIA

Deaths from diphtheria continue to be far too numerous this fall. It is yet too early to know whether or not the death rate in North Carolina from diphtheria for 1923 will be as high or higher than it was in 1922. In the July bulletin the question of diphtheria was fully discussed. Every phase of the question was gone into in detail, and it was made plain in that bulletin the death rate of 18.6 in North Carolina for 1922 was exceedingly high. It was pointed out in that issue of the Bulletin that the rate was nearly twice as high as for typhoid fever for the same year. As these lines are being written two newspaper stories, from different sections of the State, illustrate the necessity for parents being on their guard constantly in order to protect their children from this most insidious of childhood diseases. The first of the newspaper stories record the second death in one family within three weeks, and the significant part of that story is the old, old repetition of "thought it was tonsillitis." The other story, from another section of the State, described the suffering and agony by a father of three fine children on discovering that the little colored nurse who was playing every day with the children had an attack of diphtheria which had gone on for a week before being discovered, during which time she was thought by the family to be suffering simply from a "bad cold." Therefore we cannot repeat too many times, and too often, that it is a duty of parents everywhere to avail themselves of the protection offered their children through the administration of toxin antitoxin. This protection certainly should be offered to all children between the ages of six months and six years, regardless of whether they have

ever had diphtheria or not, or whether or not diphtheria is prevalent at the time. Until this is done we will continue to have a death rate entirely too high from this preventable disease.

A WINNING FIGHT

Material Reduction in Prevalence of Hookworm Infection

Most people have short memories. They quickly forget the pleasant and the disagreeable alike. The news of the day is news, and interests them only for that particular day. There are many people, however, whose memory is not taxed to recall the North Carolina of some dozen years ago, when ten thousand people had typhoid fever every year, and at least one thousand of them died. They remember when twice as many people died from tuberculosis as die now. They remember with satisfaction the great campaign waged a decade ago by the old Rockefeller Hookworm Commission, now the International Health Board, co-operating with the North Carolina State Board of Health, against the ravages of hookworm.

It took courage, and skill, and money to organize a campaign which would convince the leaders of thought throughout the State that the infected children needed examination and treatment. Mr. Rockefeller put up most of the money, and the sons of North Carolina furnished the balance of the equipment. The consequence was that the efforts to eradicate hookworm disease, so far as this State was concerned, resulted in one of the most beneficial enterprises that ever engaged the attention of our people.

The great humanitarian enterprises of the International Health Board are run on the same systematic business principles that govern all the Rockefeller activities. Every appropriation that they make is done after careful consideration, and with full knowledge of their objectives. They always know where they are going. If any plan of work tried out as an experiment does not produce results it is abandoned. So, following their usual business methods, a representative of the In-

ternational Health Board spent several months the past summer in North Carolina for the purpose of making a resurvey. The figures for Beaufort County are complete. There could be no stronger evidence produced to convince the most skeptical of the wonderful progress achieved in this field than to publish the figures here set forth.

In the original survey more than ten years ago, 423 persons were examined in Beaufort County and of that number 280 or 66.1 per cent were found infected. The resurvey resulted in the examination of 505 persons, the great majority of them children under 12 years of age, and therefore in the most susceptible period for contracting the disease; and only 60 of them were found infected. A percentage of infection of only 11.9. The reduction in infection therefore in Beaufort county amounts to 54.2 per cent. The resurvey covered ten different places in the county and people of every class were represented.

To leave entirely out of the calculation the impetus given the work of public health and the advance in modern sanitation resulting directly from the original survey, the relief of suffering and the difference between misery and happiness for thousands of people can never be computed in dollars and cents. Truly a rich man keeps only what he gives to aid the less fortunate of his fellows; and those among us mortals who would be great can only become so through service rendered our helpless brethren.

SIMPLE GOITER

In various sections of the United States the disease known as "simple goiter" is a very serious one, and one which all the authorities consider an important public health problem. In this connection it is interesting to note that of the 49,350 men examined as a result of the draft of soldiers in this State, 100 young men were discovered suffering from the disease. Although North Carolina ranked twenty-seventh in the number of cases per thousand soldiers examined, in a few sections of the State the disease

is more or less prevalent. We are writing this editorial to urge upon the health officers and county physicians in such sections especially to make a careful survey of all the school children and make a report to the State Board of Health, giving the number of children examined and the number found to be suffering from simple goiter. Undoubtedly many physicians in private practice will take pleasure in co-operating with the county physicians and health officers in undertaking this work. The Journal of the American Medical Association, in its issue of September 8, has the following editorial concerning a survey made at Grand Rapids, Michigan. As will be noted by reading this editorial, the simple measures of prevention recorded in the last sentence or two consist of the administration of about one-seventh of a grain of iodine a week in the form of an organic iodide for the period of the school year.

"Since the recent editorial note on goiter prophylaxis, the results of a goiter survey of the school children of Grand Rapids, Mich., have been announced. The work seems to have been more extensive than earlier surveys, including boys as well as girls, and extending through all classes in private, parochial and public schools. Among 26,215 pupils examined, 30 per cent had enlarged thyroids. Thirty-two per cent of those affected were boys and 67 per cent were girls. The ratio of boys to girls was about 1-2, although the moderate and marked enlargements were probably in about

the same ratio that Kimball found (1-6). Above 10 years of age, the number of girls affected was about two and a half times the number of boys. In high schools, the percentage of pupils affected ranged from 39 to 60. In view of these findings, the city health department has undertaken to prevent simple goiter by the administration of 10 mg. of iodine weekly throughout the school year. The results of the prophylaxis are, of course, not yet available."

INJURIOUS SUBSTANCES PROHIBITED IN ICE CREAM

A new ice cream law which became effective in Pennsylvania March 20 prohibits the use of all chemicals and doubtful substances that can prove injurious to consumers. Cocoanut fat and other oils are prohibited in the manufacture of ice cream, as well as the use of paraffin in chocolate-coated ice cream. The use of Tragacanth gum is eliminated under the new measure, and the sale of any imitation or substitute for ice cream under a coined or trade name is forbidden.—*The Nation's Health.*

STATE WATERWORKS ASSOCIATION

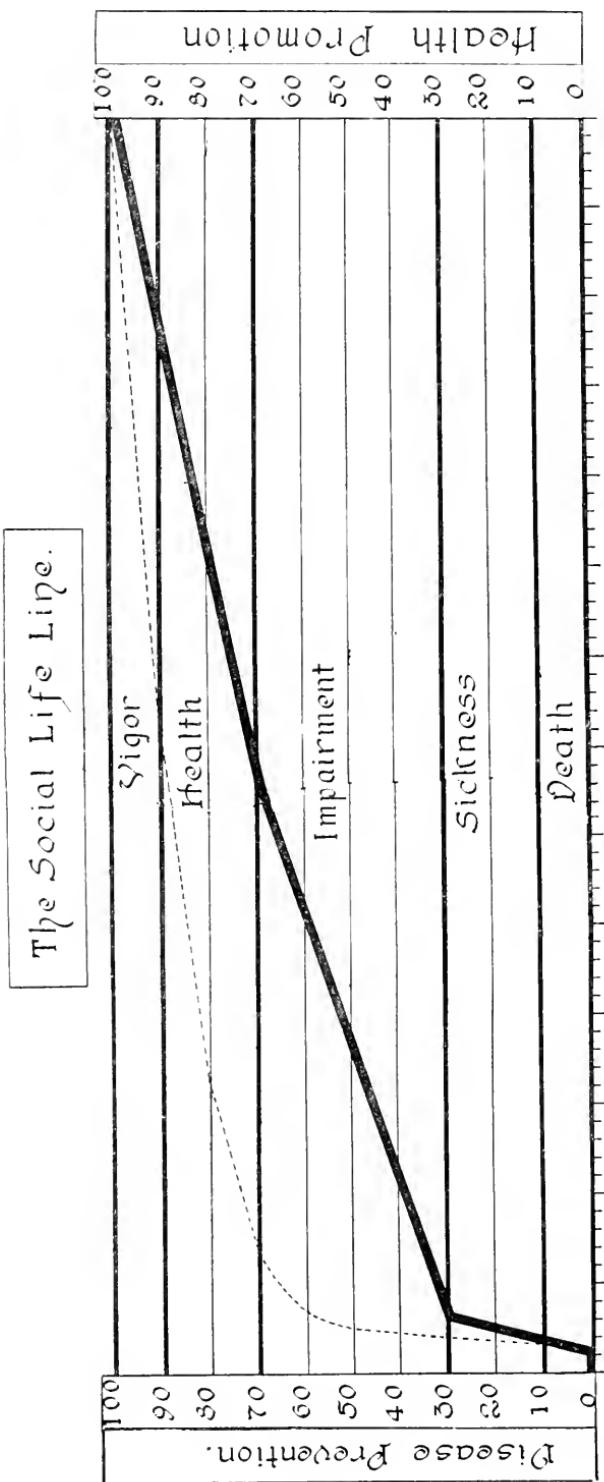
The 1923 convention of the North Carolina section, American Waterworks Association, will be held in New Bern, November 13, 14, 15.

YOUR OPPORTUNITY FOR HEALTH

W. S. Rankin, M.D., in Hygeia

In this modern day of big things, when our eyes are so much on mass movements and governmental and social machinery, the individual has almost been lost sight of. We see the perspective, and we fail to discern the finely chiseled features of the man standing among the many. In thinking of society so much, we think too little of the individual. Individuals make society; society does not make

individuals. When the Great Teacher saw the multitude, he left them. He forsook the crowd and went into the mountain, into a solitary place, and delivered to a few men, a small select group, the everlasting principles upon which the future of the world depends. When Abraham argued with God for the salvation of the million of people living in wicked Sodom and Gomorrah, God promised to save the nine hun-



dred and ninety-nine thousand nine hundred and ninety if Abraham would find only ten righteous people living in those two wicked cities. Salvation—physical and spiritual, personal and social, past, present, and future—has always rested in the large and in the last on the individual.

Health is the primary and the most fundamental condition that determines what the individual is to be. On health rests vigor; vigor conditions interest in the opportunities of life; interest determines whether effort, physical and mental, is to be fatiguing work or fascinating play; the fascination of work underlies efficiency; efficiency conditions satisfaction; satisfaction is the key that opens that realm of life which, in the here, we call happiness, and in the hereafter, heaven. The individual's part, your part, in determining what your health and its attributes shall be is illustrated by an old story as true today as it was in the hazy dawn of Grecian mythology.

The fates were three women who determined destiny. Their names were Clotho, Lachesis, and Atropos. Clotho spun the thread of life and determined its vital quality. Lachesis held the thread in her hands, measured off the days and years, and recorded the chief events. Atropos, the grim-visaged sister, held the scissors, decided when life should terminate, and clipped the thread. These three women of ancient Greece are still with us, having changed their dresses and their names, but not their business. Today Clotho is called stock; Lachesis, society; and Atropos, self, the three fates having become the three "S's." Stock spins the thread of life and determines the quality of your being. Over this fate you have no control. Stock is deaf.

The moving finger writes; and, having writ,

Moves on: nor all your piety nor wit
Shall lure it back to cancel half a line,
Nor all your tears wash out a word
of it.

Society holds the thread of life in her hands, keeps a record of its beginning and its ending and its chief events, and determines to some extent

the conditions through which it passes. Over society you have a little control, your controlling influence corresponding in a large measure with what you do for her, but at best you have but a small influence. Society is not as deaf to you as stock, but she is very hard of hearing. Self clips the thread with the keen-edged scissors of an acute disease or sudden death, or haggles away

The Social Life-Line

100.	.....	100
90.	Vigor	90
80.	Health	80
70.	.....	70
60.	.....	60
50.	Impairment	50
40.	.....	40
30.	.....	30
20.	Sickness	20
10.	.....	10
0.	Death	0

Where are you on this social life-line?

at the frazzly thread with the dull edge of a chronic disease. Self, mind you, holds the scissors; self says when. Over self, unlike deaf stock or society, hard of hearing, your control is as complete as you care to make it. Your life, your health, your vigor, your interest in your work, your pleasure, your efficiency and happiness are, after all, largely in your own hands.

Your health officer is sent to you as the agent of society. He is employed by and owes his services to the thousands, hundreds of thousands, and millions who pay him his salary. Your part of society's time is represented by a fraction, the numerator of which is one and the denominator the total population of the city, county, or State for which the health officer works. If you live in a city of a hundred thousand that spends fifty thousand dollars a year in protection of the health and lives of its citizens, and if your health department works ten hours a day, your part of the time of the health department during the course of the year is twenty-three minutes. Society reaches you only by long distance, and at longer intervals with a bit of advice that is of service, or with



THE THREE FATES OF MYTHOLOGY

some protective vaccine or serum that is free, or with the limited protection that its quarantine against contagious diseases affords you. Society's limitations to reach you are many and her opportunities to serve you are few.

You, on the other hand, find opportunity at every turn, at practically every step, of life's journey. You may

give the matter of your health a day's consideration for every minute that the health officer can give you. You spend on a single premium of an accident or sickness insurance policy a sum greater than the amount appropriated by society for the protection of your health during your entire lifetime. Opportunity for improving and

promoting your physical vigor is as constantly with you as the air and as near you as your clothing. This opportunity gets out of bed with you in the morning, directs your bath, selects your clothing, brushes your teeth, orders a wholesome meal, cleanses your system, modifies the air that you breathe, regulates your work and play, influences your reading, and leaves you only at the end of the day safely and soundly to the recreating power of sleep.

Your opportunity for health improvement appeals to you with strength that is in exact proportion to your understanding of the meaning of health. The average man conceives health to be a condition that permits a person to be out of bed and about his business, or, we might say, makes the distinction between health and disease by the difference between the perpendicular and horizontal positions of the body. This common impression is altogether wrong. There is no sharp distinction or abrupt break between health and disease. The one fades by almost imperceptible gradation into the other. There is a real life-line that serves well to bring out the fine difference between health and disease.

The real life-line exists, not in fake, but in fact, not running through the palm of the hand, but running through the various vitality levels of the average composite group of society. By composite group of society is meant a group that includes the races, sexes, ages, and physical conditions as they exist among the people generally. In order to include all the physical levels within the group, our composite group must be large enough to include one person who dies during the year. As one person of approximately eighty-four persons dies during the year, the group will consist of eighty-four. These eighty-four are indicated by the eighty-four equidistant spaces in the diagram. Each space represents one of the individuals of the group. The heavy dark line, passing from the lower left-hand corner of the diagram to the upper right-hand corner, is the social life-line on which are suspended, at the various levels of vitality, the eighty-four members of the group, their vitality level being indicated by

the segment of this line lying immediately above the space of the base line. This social life-line spanning the distance between the quick and the dead begins with the first inch on the base line at zero vitality, indicating the one person who dies during the year. The next section of the line, ranging from the moribund at almost zero to the 30 per cent level of vitality and lying above two of the spaces on the base line, indicates the two members of the group who are sick abed to the point of incapacitation. The next thirty-three inches of the social life-line, passing through the zone of impairment from the 30 to the 70 per cent level of vitality, represents the thirty-three persons of the group, some of whom are "just able to be up and about," and others of whom are "not quite up to the scratch," and others intermediate between these two states of being. Next we come to the thirty inches of the line spanning the zone of health between the 70 and 90 per cent levels of vitality and representing thirty persons who may be classified as healthy—neither impaired nor vigorous—but healthy. Then, finally, we come to the last section of the line, lying between the 90 and 97 per cent levels of life and representing twenty members of the group who are vigorous in mind and body, who live on the heights of being, who are inspired with lofty views and high ideals, and who pursue their tasks with enthusiasm.

You are suspended somewhere on such a life-line. You determine, very largely, your place on the life-line. There are few of us whose positions on the life-line are rigidly fixed by circumstance, who cannot by the alteration of some habit, by cutting out too much tobacco, by regulating the diet, by properly apportioning work, rest, and sleep, by better regulating waste elimination, few of us who cannot move up the social life-line to a higher level—10, 20, or 30 per cent higher. If there were some short-cut to moving into a lofty realm of being, some patent medicine that you might buy, what a price you would pay gladly! But there are no short-cuts by which to attain the physical ideal. We reach the heights of physical life by right

habits followed day in and day out. The price of health, like that of liberty, is eternal vigilance.

The vital level at which you live has much to do with your attitude toward life, with your reactions to your surroundings. Life is nothing more than a series of reactions to stimuli—physical, chemical, and spiritual. The finer stimuli—to which only a body keenly active is sensitive—are of a character referred to as inspiration. "And the Lord God formed man of the dust of the ground, and He breathed into his nostrils the breath of life, and man became a living soul." Inspiration, the second of the three steps in man's creation, followed the making of a perfect form and was conditioned by physical perfection. So it is today.

The health motives are, like the great motives of life in general, two—fear and love. One drives, the other pulls. One is a negative force and the other a positive one. Fear of disease in the physical world, like the fear of hell in the spiritual realm, is a force to drive the primitive, the ignorant, those of small understanding.

those who live at such a low level of life as not to be in touch with the larger view and the higher ideals. The love of life, the love of the physically perfect, like the love of the perfect of the higher order, is the positive ideal, a thing that forever lifts upward to the higher levels of life. You are not likely to attain the possibilities of your physical being, with all which that carries with it, if your chief object is to avoid actual disease. On the other hand, you are most likely to attain to a vigorous, efficient, and happy life if you get the right conception of what health is and realize the possibilities of its attainment.

You may help your health officer—indeed, you will help your health officer—if you get the right conception of health, if you fall in love with health and lose fear of disease, if you realize that where society has one opportunity to improve your health you have a thousand such opportunities—in short, if you understand, as wise old Benjamin Franklin said, that "God (and society) helps those that help themselves."

FOREIGN HEALTH OFFICERS VISIT NORTH CAROLINA

Eminent Sanitarians from Many Countries Spending Month Studying
Public Health Problems and Methods of Administration Here

An event which may be fraught with far-reaching consequences for world health is the third general interchange of health officers arranged by the Health Section of the League of Nations which is now taking place in the United States.

Representatives of nearly all the nations of Europe, South America, and Central America, delegated by their respective governments to participate in a course of study and observation, arrived in the United States the first week in September, and will remain for approximately three months. Until September 22 the delegates remained in Washington, studying national health organization as administered by the United States Public Health Service. Following the close of the course

of study of the national health agency, the delegation of visitors was separated into three groups, one going to Virginia, one to Alabama, and a third to North Carolina, for a stay of about one month in each State. Thence the groups will proceed to Massachusetts, Pennsylvania, and New York, respectively, for the study of three Northern States. Following this, the groups will make a study of health administration in three of the large cities of the East, namely, Boston, New York, and Philadelphia. The entire delegation will reassemble in Washington late in November for a final conference prior to departing for their respective home countries.

The members of the group coming to North Carolina are as follows: Dr.

S. Slonewski, San. Epid. Bureau, Moscow, Russia; Dr. A. Marzeeff, Chief de San. Epid. Kharkof, Ukraine; Dr. D. J. Hulshoff-Pol, government inspector of Public sanitation, LeHaye, the Netherlands; Dr. J. Batko, provincial health officer, Cracow, Poland; Dr. Karl Samnemann, port medical officer, Hamburg, Germany; Dr. Enrique Orvananos, government inspector of hygiene, Mexico City, Mexico; Dr. J. Dueci, of the faculty of medicine, Santiago, Chile; Dr. Cora Mayers, director League of Social Hygiene, Santiago, Chile.

Dr. Orvananos is accompanied by his wife, and Dr. Mayers by her sister. The latter, Miss Elena Mayers, will remain in the United States for a year pursuing a special course of study. Dr. Dueci was detained in New York on account of illness.

The delegation is accompanied by Dr. Norman V. Lothian, of the Health Section of the League of Nations. He is dividing his time among the three groups in the several States being visited.

The North Carolina group arrived in Raleigh on the afternoon of September 23. For ten days a course of study of State health problems and methods of administration was pursued in the office of the State Board of Health, each phase of work being handled by the different members of the staff of the board in charge. The course began with an interesting and instructive lecture on civil government given by Dr. E. C. Brooks, president of the State Agricultural and Engineering College and until recently State Superintendent of Public Instruction. Mrs. Kate Burr Johnson, Commissioner of Public Welfare; Dr. William Moore, State Veterinarian, and Mr. W. M. Allen, State Food Chemist, very kindly assisted the staff of the board in discussing subjects which are closely allied with the work of the board, but which are administered under other divisions of the State government.

Following the ten days in Raleigh the group was taken to various sections of the State for the purpose of studying and observing at first hand the practical working of public health administration in the various counties.

The following is the program prepared for the thirty days spent in this State:

PROGRAM

Visiting Foreign Health Officers State Administration

September 23 to October 24

SUNDAY, September 23.

Party arrives; informally received; gets settled in quarters—Bland Hotel.

MONDAY, September 24.

Morning, 10 to 1—Comprehensive instruction in Civics from North Carolina Angle—Dr. E. C. Brooks, President State College, and, until recently, State Superintendent of Public Instruction.

Afternoon, 3 to 5—Round Table Conference.

TUESDAY, September 25.

Morning, 10 to 1—The Principles of Public Health Work—Dr. W. S. Rankin, Secretary State Board of Health and State Health Officer.

Afternoon, 3 to 5—Round Table Conference.

WEDNESDAY, September 26.

Morning, 10 to 7—Educational work of the Board—Dr. G. M. Cooper, Assistant Secretary.

(Last hour Round Table Conference.)

Afternoon, 3 to 5—Vital Statistics—Dr. F. M. Register, Deputy State Registrar of Vital Statistics.

THURSDAY, September 27.

Morning, 10 to 1—The System of County Health Work—Dr. E. F. Long, Director Bureau of County Health Work.

Afternoon, 3 to 5—Medical Inspection of School Children and Practical Follow-up Methods—Dr. Roy C. Mitchell, Director Bureau of Medical Inspection of Schools.

FRIDAY, September 28.

Morning, 10 to 1—Infancy and Maternity Problems—Dr. K. P. B. Bonner, Director Bureau of Maternity and Infancy.

The Public Health Nurse—Miss Rose M. Ehrenfeld, Division Health Officer.

(One hour each—one hour Round Table Conference.)

Afternoon, 3 to 5—Public Water Supplies, Excreta Disposal—Mr. H. E. Miller, Director.

ON THE BILTMORE ESTATE

During their tour of North Carolina the delegates from the Health Section of the League of Nations visited the famous Biltmore Dairy on the Vanderbilt estate near Asheville. In addition to the visitors the above photograph shows representatives of the State Board of Health, the Asheville Department of Health, officers of the Biltmore Dairy, and Lt. Col. J. A. Miller, medical officer commanding the hospital for the tuberculous at Oteen.



Bureau of Sanitary Engineering and Inspection.

SATURDAY, September 29.

Morning, 10 to 1—The Laboratory of Hygiene—Dr. C. A. Shore, Director (at the Laboratory).

Afternoon, 3 to 5—Visit State Hospital for Insane.

SUNDAY, September 30.

Rest and auto trip to University of North Carolina.

MONDAY, October 1.

Morning, 10 to 1—Welfare Work—Mrs. Kate Burr Johnson, Commissioner of Public Welfare.

Afternoon, 3 to 5—Food Control Measures—Mr. W. M. Allen, State Food Chemist.

Animal Control Measures—Dr. William Moore, State Veterinarian.

TUESDAY, October 2.

Morning, 10 to 1—General Review—Dr. W. S. Rankin.

Afternoon, Depart for county location.

Rural and Institutional Health Work

OCTOBER 2-21.

TUESDAY, October 2.

Proceed to Asheville, 4 p. m.

WEDNESDAY, October 3.

Morning—Observation U. S. Government Hospital, No. 60, for treatment of disabled tuberculous veterans, Oteen.

Afternoon — Observation Biltmore Model Dairy and Plant of Carolina Creamery Company.

THURSDAY, October 4.

Observation State Institutions: State Hospital for the Insane and the State School for the Deaf at Morganton.

FRIDAY, October 5.

Morning, 10 to 1—Observation dental clinics, white and colored, Rowan County.

Afternoon, 3 to 5—Observation sanitary work.

SATURDAY, October 6.

Observation rural baby clinics.

SUNDAY, October 7.

Rest at Charlotte.

MONDAY and TUESDAY, October 8 and 9.

Observation open-air school, under-nourishment classes and school inspection, Mecklenburg County Health Department.

WEDNESDAY, October 10.

Observation State Orthopedic Hospital at Gastonia. Proceed to Southern Pines.

THURSDAY, October 11.

Morning—Observe operation tonsil-adenoid clinic, Carthage, Moore County.

Afternoon—Observation Home and Industrial School for Girls and Women at Samarcand.

FRIDAY, October 12, and SATURDAY, October 13.

Study of Tuberculosis Sanatorium Management at Sanatorium. Return to Raleigh.

SUNDAY, October 14.

Rest.

MONDAY, October 15.

Observation State Institution: Caswell Training School for Mental Defectives, Kinston.

TUESDAY, October 16.

Conclude observation of Caswell Training School, and observe clinics of the Lenoir County Health Department at Kinston. Proceed to New Bern.

WEDNESDAY, October 17, THURSDAY, October 18, and FRIDAY, October 19.

Observe malaria and hookworm work: under direction Dr. H. A. Taylor, in Craven, Beaufort and Pamlico Counties.

SATURDAY, October 20.

Final round table conference in offices of State Board of Health with Dr. W. S. Rankin.

Unforeseen circumstances made it necessary to curtail the program by three days. Observation of the State hospital for the negro insane at Goldsboro and of the work of the Wayne County Health Department, scheduled for Saturday, October 20, and two days with the Wake County Health Department, October 22 and 23, were therefore omitted.

The members of the delegation on Saturday evening entertained at dinner the members of the staff of the board and those who had assisted in the course of study at Raleigh. They left Sunday evening for Baltimore, and thence to Albany, N. Y., for study in that State.

MEDICAL HISTORY

(Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.)

WATER

Water, the fluid which forms the oceans, lakes and rivers composing three-fourths of the earth's surface, and that is as essential to life on this earth as the air itself, is a therapeutic agent older than thought or reason. In chemistry, water is known as hydrogen monoxide, that is, it is a compound substance, consisting of two volumes of hydrogen, a colorless, odorless, tasteless gas, in combination with one volume of oxygen, another colorless, odorless, tasteless gas. In the realm of religious affairs the "liberalists" poke fun at the "fundamentalists" for their faith in the Biblical miracles. And yet here, of necessity used every moment by all plant and animal life, indeed a substance constituting the major portion of the inorganic composition of both plant and animal matter, is a miracle of Nature capable of exciting open-eyed wonder. Hydrogen, the lightest known substance in the world, being a gas more than 14 times as light as air, in combination with another gas, forms water, a substance that is almost non-compressible. Until the latter part of the 18th century, water was classified by the chemists as one of the elements, like silicon or sulphur. A combination of two volumes of hydrogen with one of oxygen forms water. A combination of about four volumes of nitrogen with about one volume of oxygen forms the principal constituents of atmospheric air; but distilled water is about 815 times heavier than atmospheric air.

Water is a universal solvent, and on account of this power it is never found chemically pure in nature. Even in rain water, which is the purest obtainable in nature, there are always traces of such substances as ammonia. Water takes a solid form, that of ice or snow at or below 32 degrees F. It goes off into the air as vapor when heated sufficiently hot. If water be

cooled between 40 degrees F. and 32 degrees F. when it becomes a solid it expands, and if confined it expands with terrific force. On the other hand, if water be heated to the boiling point it expands, and if confined, expands with even greater force.

More fool advice on the use of water, "internally, externally and eternally," has been handed out to a gullible public than on any other known subject. It is one of the numerous subjects on which opinion, and especially group opinion, seldom ever agrees. Of course the Baptists recommend its use externally all over at least once, but they are by no means a unit on agreeing that it should constitute the sole beverage for internal use. The Methodists in these parts allow that a very little externally should suffice, but it should be liberally used internally.

One physician will advise a patient to drink six glasses of hot water every morning before breakfast, and his fellow practitioner across the street will tell the same patient that four glasses daily are sufficient, and it should not be so hot, and what is more important, it should be taken at bedtime instead of before breakfast. At present there are about forty "physical culture" journals decorating the news-stands each month at about 25 cents per decorate, illustrating the external use of water as exemplified by the "bathing beauties" of Atlantic City or Timbucto. This literature is certainly a mighty advance over the set of resolutions solemnly passed by the medical society of Cincinnati only a few decades ago expressing its opposition to the institution of bath tubs because in the opinion of that learned body of medical men such things were a "detriment to health." The politicians over in Virginia went the Cincinnati doctors one better by popping a tax of \$30 on every man who dared

to install one of the pesky things, on the ground that to take a bath in a bath tub, presumably using water, was undemocratic.

Twenty years ago some of the professors in many of the medical colleges were conducting experimental classes in order to establish the best method of drinking water with reference to time, place and quantity. The plan which seemed most popular was for some professor to select a dozen students and stay with them somewhat after the manner of a court officer with a "hung" jury, for a period of thirty days. The bunch ate what they pleased but took a specified quantity of water with their meals only. Another bunch under the care of another professor drank a specified quantity of water only between meals. Still another squad imbibed theirs only at bedtime, while yet another one took their water before breakfast. Finally a control group not only ate what they pleased but drank their water when, where and in such quantity as they liked. All were weighed "before and after," and a pleasant time was had by all, especially the press agents of the colleges. Naturally when the evidence was all in and it was found that the group who drank their water as they pleased had done as well or a little better than any of the others, most of the colleges decided to leave the question alone for a while. Some twelve or fifteen years ago, or until the chiropracs came along and located the seat of all diseased conditions, from ingrowing toenail to itch, in a tiny area of the spinal column, the hydropaths were eloquently proclaiming that lack of water treatment was the cause of all troubles.

In the meantime water remains the chief stock in trade (except the newspapers) of the great half-billion-dollar American "patent" medicine enterprise. After all, if the public did not spend this huge amount for water in the form of "patent" medicine for internal use there might be so much left in the creeks and rivers and lakes that the normal humidity of the atmosphere might be upset and the crops and animals suffer along with the "vested interests."

The one object the editor has in writing this article is to drive home the fact that water being a necessary substance for the maintenance of human life, therefore one of the first laws of sanitation requires that drinking water for every community should be free from contamination all the time.

It matters little how much water or how little a person drinks, or how often one drinks it, so the natural thirst is satisfied and no more; but it does matter essentially that what is consumed be unpolluted. It is a mistaken idea that most people have that somehow water acts in the human alimentary canal as it does in a sewer pipe. So, the more water imbibed the "cleaner" the "system." Water being essential to life, the human body must have plenty for its needs, but an excess beyond the wise limitations of natural instinct is harmful. The horse who is taken to the trough but refuses to drink, probably has more sense than the biped who insists on trying to force him to drink when he does not want it.

This is not the place to go into a history of water-borne diseases, but suffice it to say that drinking water free from pollution is one of the greatest boons to mankind.

THE BUSINESS SIDE OF PUBLIC WATER SUPPLY

By H. E. Miller, C.E.

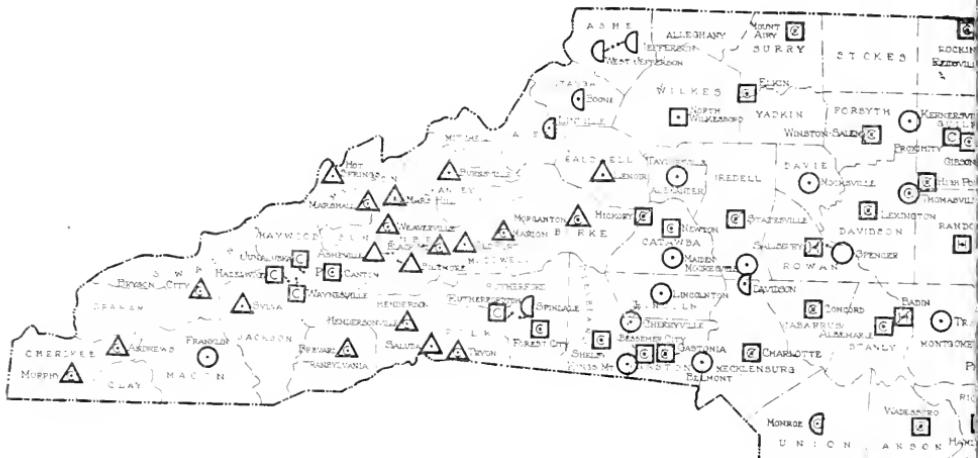
Discussions of public water supply that have appeared in this *Bulletin* heretofore have dealt exclusively with the public health significance of this important public utility. The business side of water supply and its relative

position in the economic structure of the State will now be considered.

Distribution

Referring to the map on pages 16-17, it will be observed that there are a

BUREAU OF SANITARY ENGINEERING N. C. STATE BOARD



GROUND WATER SUPPLIES

SHALLOW GROUND WATER

TOWN	POP.	TOWN	POP.
ASHEVILLE	838	MURKIN	4,064
AMMONIE	1,428	BLUFFSTON	196
BOONE	374	EDDINGHAM	767
CASPER	882	SCOTLAND NECK	2,061
DAVISON	1,159	SPINDALE	610
JEFFERSON	188	WEST JEFFERSON	492
LINVILLE	245		
* CHLORINATED			

DEEP-SEALED GROUND WATER

ARTEN	1,278	MAXTON	1,197
BLAFTON	2,988	MCCKIVILLE	1,147
BELMONT	1,818	MOREVILLE	4,315
BENSON	2,254	MOREHEAD CITY	1,488
CHAUVIN	1,103	MOUNT GALE	2,297
CHERRYVILLE	1,884	MOUNTAIN	939
CLINTON	1,412	NEW BERN	12,198
CLINTON	2,111	OXFORD	3,908
DUNN	1,805	PAYNTER	1,847
EDENTON	2,777	PEPSI SPRINGS	1,118
ENFIELD	1,645	ROXBORO	3,114
ELM CITY	725	SAINT PAULS	1,147
FARMVILLE	1,030	SELMAR	1,601
FRANKLIN	1,780	SHUTT HILL	700
FRANKLIN	773	SHELBY	2,510
FRANKLIN	1,058	SOUTHPORT	1,664
GRAHAM	2,982	SPRING HILL	1,221
LAURENVILLE	856	TAYLORVILLE	1,122
LAURENVILLE	1,110	THOMASVILLE	5,676
KELLS MOUNTAIN	267	TROY	1,102
Kinston	8,771	WARRINGTON	927
LA GRANGE	1,380	WARWICK	1,108
LAWRENCE	2,643	WENDELL	1,539
LILLINGTON	2,533	WILMINGTON	1,065
LODGEON	3,420	WILMINGTON	1,803
LOTTON	740	WILMINGTON	1,613
LOTTON	1,268	WRIGHTSVILLE	241
PRESTON	1,282	ZEBULON	1,983
* CHLORINATED			

SURFACE WATER SUPPLIES

UNFILTERED - UNSTERILIZED

TOWN	POP.	TOWN	POP.
ASHEVILLE	28,204	MARS HILL	264
BALMORAL	172	MAGARA	58
BURNSVILLE	515	OLD FORT	931
HOT SPRINGS	423	SAULDA	349
LENOKA	574	SYLVIA	563

UNFILTERED - LIQUID CHLORINE

ANDES	1,746	MARSHALL	748
BLACK MOUNTAIN	931	MURKANTON	2,667
BRENTWOOD	1,626	MURPHY	1,314
BRYSON CITY	692	TRYON	1,057
HENDERSONVILLE	3,723	WEAVERVILLE	1,608
MARION	1,784		

FILTERED - UNSTERILIZED

JONESBORO	889	WEST MELVINBURG	2,960
LOUISIANA	1,234	SANFORD	5,977

FILTERED - HYPOCHLORITE

ASHEBORO	5,633	JACKSBURG	12,504
BADIN	3,040	STATE HOSPITAL	1,930

FILTERED - LIQUID CHLORINE

ALBEMARLE	1,631	MEBANE	1,151
BEASERME CITY	2,176	MOUNT AIRY	4,732
BURLINTON	5,532	NEWTON	3,021
CANTON	2,564	PINHURST	55
CHAPEL HILL	1,403	PROXIMITY	6,500
CHARLOTTE	44,338	RALEIGH	24,418
CONCORD	9,903	REIDSVILLE	5,555
DURHAM	21,719	ROCKINGHAM	2,506
ELIZABETH CITY	6,925	ROCKY MOUNT	12,742
ELKIN	1,193	RUTHERFORDTON	1,633
FAVETTEVILLE	2,677	SAMCARLTON	115
FOREST CITY	2,312	SHELBY	3,658
GASTONIA	12,671	SMITHFIELD	1,635
GOLDEN PO	11,296	SOUTHERN PINES	743
GREENSBORO	19,661	STATESVILLE	7,690
GREENVILLE	3,772	TABORO	4,566
HAMLET	3,623	WADESBORO	2,648
HAZELWOOD	484	WAKE FOREST	1,428
HENDERSON	5,221	WASHINGTON	6,166
HEARTFORD	1,704	WAYNEMVILLE	1,342
HICKORY	3,076	WEEDON	1,361
HIGH POINT	14,507	WILMINGTON	33,372
LAKE STRATFORD	17	WILSON	13,612
LEAVENWORTH	1,606	WINSTON-SALEM	48,345
LEXINGTON	3,254	ZEBULON	955
LUMBERTON	2,691		

LABORATORY CONTROL

CHEMICAL

TOWN	POP.	TOWN	POP.
BASIN	3,044	ELIZABETH CITY	1,143
BURLINTON	5,532	MONTE AIRY	4,732
CHAPEL HILL	1,403	PROXIMITY	6,500
CHARLOTTE	44,338	ROCKY MOUNT	12,742
CONCORD	9,903	SALISBURY	1,143
DURHAM	21,719	STATEVILLE	1,271
GASTONIA	12,671	TABORO	4,566
HAMLET	3,623	WASHINGTON	6,166
HICKORY	3,076	WILMINGTON	33,372
HIGH POINT	14,507	WINSTON-SALEM	48,345
LEXINGTON	3,254	ZEBULON	955

BACTERIOLOGICAL

TOWN	POP.	TOWN	POP.
CHAPEL HILL	1,403	RALEIGH	24,418
CHARLOTTE	44,338	SALISBURY	1,143
CONCORD	9,903	WAKE FOREST	1,428
DURHAM	21,719	WILMINGTON	33,372
GASTONIA	12,671	WINSTON-SALEM	48,345
HIGH POINT	14,507	ZEBULON	955
LEXINGTON	3,254		

RECAPITULATION

TYPE OF SUPPLY	NUMBER SUPPLIED
SHALLOW GROUND	1
DEEP SEALED GROUND	5
UNFILTERED SURFACE	2
UNFILTERED SURFACE - CHLORINATED	1
FILTERED SURFACE	1
FILTERED SURFACE - CHLORINATED	1
TOTALS	15
SHALLOW GROUND, CHLORINATED	1
DEEP SEALED GROUND, CHLORINATED	5
UNFILTERED SURFACE, CHLORINATED	1
FILTERED SURFACE, CHLORINATED	1
FILTERED, CHEMICAL CONTROL	2
FILTERED, BACTERIOLOGICAL CONTROL	1

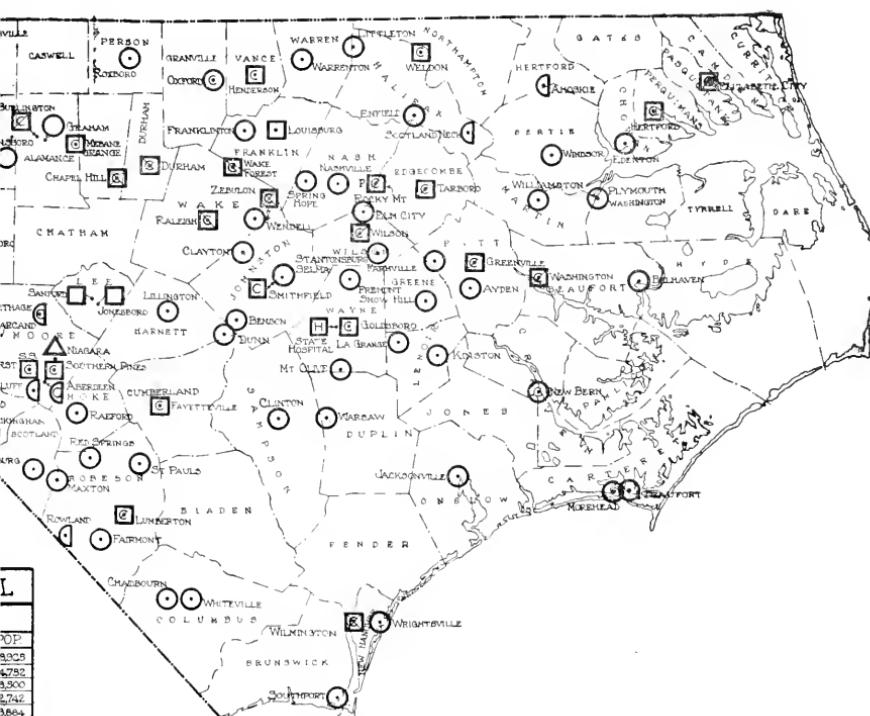
EXPLANATION

Each supply is represented on the map by an appropriate symbol indicating the source of the supply, and kind of treatment, if any, practiced. The symbols used are listed with definitions in the legend at the lower right-hand corner.

Each supply, together with the population of the community served, is also listed under appropriate group headings in the lower left-hand corner, indicating the source of supply, and kind of treatment practiced.

Under the heading, "Recapitulation" at the center of the page will be found a summary. In the first column the various types of supplies with reference to source and kind of treatment are indicated. In the second column is shown respectively the number of communities served by each type. The third column shows the percentage ratio of the number of communities served by any given type as compared to the

ENCERING AND INSPECTION O OF HEALTH



THE PUBLIC WATER SUPPLIES OF NORTH CAROLINA

APRIL-1923

LEGEND:

□	SHALLOW GROUND SUPPLY	△	SURFACE SUPPLY-UNFILTERED
○	DEEP SEALED GROUND SUPPLY	“C”	STERILIZED - LIQUID CHLORINE
□	SURFACE SUPPLY-GRAVITY FILTERS	“H”	STERILIZED - HYPOCHLORITE
□	SURFACE SUPPLY-PRESSURE FILTERS	□	CHEMICAL CONTROL OF FILTRATION
□	SURFACE SUPPLY - SLOW S. FILTERS	□	BACTERIOLOGICAL CONTROL FILTRATION

PERCENT TYPE SUPPLIES	POP SERVED	PERCENTAGE TOTAL STATE POPULATION SERVED	PERCENTAGE COMBINED PUBLIC WATER SUPPLY SERVED
86	13,279	.53	218
368	120,608	4.82	1983
138	50,884	2.03	836
388	423,704	18.82	6963
1000	609,463	24.30	100.00
20	5,804	.24	87
20	1,480	.06	24
72	18,027	.60	247
362	415,524	16.82	6840
171	303,981	12.15	5000
86	234,317	9.40	3450

OF MAP

total number of communities enjoying public water-supply service. The fourth column shows the total population served by each type of supply.

The fifth column shows the percentage ratio of total population served by each type of supply as compared to the total population of the State. The sixth and last column shows the percentage ratio of population served by any given type of supply as compared to the total combined population of all communities that have public water-supply service.

Under the heading, "Laboratory Control" are listed the filtered water supplies in which the purification process is regulated and conducted under constant laboratory supervision at the plant, chemical testing and bacteriological testing respectively. In some plants only chemical testing of the untreated and treated water are practiced, while in other instances both chemical and bacteriological testing are practiced. In all instances where bacteriological testing is practiced, chemical tests are also conducted.

total of 152 towns and cities in North Carolina served by public water supply. The distribution of water supplies throughout the State is indicated on the map.

It will be observed that in all but fifteen of the counties in the State there is at least one community served by public water supply. These fifteen counties in the mountains and along the coast. The 152 towns and cities served by public water supply embrace all of our principal cities and larger towns, and many small towns of surprisingly small population.

ECONOMIC FACTORS INVOLVED

Annual Revenue for Service and Cost of Operation.—On the basis of annual revenue produced, the 152 supplies are grouped as follows:

One hundred eleven derive an average annual revenue of \$5,000 from water-supply service, and twenty-two derive an average annual revenue of \$25,000 from water-supply service. Seven derive an average annual revenue of \$140,000 from water-supply service. Together there is derived an annual revenue of \$2,500,000 from water-supply service furnished by the 152 water supplies in North Carolina. This data is a conservative estimate based on figures furnished by ninety-five superintendents of waterworks, consisting of figures from the three different classes as follows: Forty-six of the \$5,000 class, twenty-one of the \$25,000 class, and an average of actual figures showing the revenue of the seven cities of the \$140,000 class.

With regard to cost of operation it is found that the total combined cost of operation is practically identical with the total combined revenue.

Capital Invested.—Using the same figures as a basis it is estimated that the total combined investment in water supply systems in North Carolina is \$25,000,000. These figures are known to be well within conservative limits. Since in the mind of the average citizen the economic phase of water supply is most often associated with the filling station sign, "Free air and Water," the fact that not only the investment but that the combined revenue for water-supply service in the State runs into millions of dollars,

these figures, although conservative, will no doubt be astonishing.

If we consider water supply as an industry, then on the basis of the State as the unit, our plant is valued at twenty-five million dollars, and our operation cost is two million five hundred thousand dollars. In this instance as well as in any other big industry, a knowledge of the volume and value of the gross product of our plant is of vital interest.

Gross Value of Plant Product.—One of these products is convenience. Upon this product we have no basis upon which to establish a value, but it will be considered as a by-product upon which each person can place a value in accordance with his own judgment.

Another product is that public water supply makes public sewerage systems possible. Imagine, if you can, a city without a sewerage system. Assign to this product, also, a value of your own choice.

A third product is water readily available in large quantities for manufacturing purposes. Imagine, if you can, the significance of this product, when you stop to consider the marvelous development of manufacturing in North Carolina.

A fourth product is the availability of adequate quantities of water at high pressure for fighting fire.

The fifth product, the most important of all the products of this huge industry, namely, the conservation of earning power resulting from the public health protection afforded by safe water supply, has a value that the human mind can hardly grasp.

The most reliable and conservative economists and statisticians place the minimum average economic value or earning power of a human life at \$3,000. In fact, this value is only slightly more than an able-bodied slave was worth in the days of our grandfathers. If we compare the value of a dollar then to the present value of the dollar, it is less than the value that was placed upon a slave.

The combined population of the towns and cities of North Carolina served by public water supply is 608,453 persons. The economic equivalent, therefore, involved is \$1,825,359,000. By the existence of 152 public

water supplies in North Carolina, therefore, with capable management, effective operation of purification devices, and safeguarding of the sources of supply against pollution, an economic value of \$1,825,359,000 is conserved for the State. This, however, represents only a portion of the economic value involved. There are 1,892,000 other persons who visit the various trading centers on numerous occasions during the year. These people represent an additional 5,676,000,-000 dollars worth of economic value conserved by virtue of safe public water supplies in the towns where they market their product and buy their supplies. It is true that this latter group are not entirely dependent upon public water supply, but if the water supplies of the towns that they visit to conduct business were polluted and laden with the germs of disease, one drink of water would be sufficient to produce wracking, devastating disease in the most robust.

A FEW OBVIOUS CONCLUSIONS

The purpose of the foregoing computations is to illustrate the fact that:

1. Water supply as an industry, in point of capitalization, ranks among the foremost industries of the State.

2. In providing safe drinking water for the urban communities and their rural visitors, a vital economic value or earning capacity, amounting to billions of dollars, is conserved for the State.

3. Admitting the foregoing, it follows without argument that the public water supply of any community deserves the active interest and support of every citizen of the community, and the benefit of the best business judgment and administrative ability the community affords.

THE STOCKHOLDERS' POINT OF VIEW

Every water consumer and every taxpayer of a community served by public water supply is a stockholder in this gigantic industry. It is safe to venture, however, that the stockholders in this industry know less of actual fact about the financial status, details of production, quality of product, and needs of their plant than the stock-

holders of any other industry. The average person confines his interest in water supply to whether or not the water runs when he turns the spigot, and judges its quality by the presence or absence of mud.

IS STOCK ABOVE OR BELOW PAR VALUE?

Suppose you ask yourself a few questions: What is the source of our water supply? Is the source adequately protected? Is the water treated? How is it treated? Where is the plant located? Is it modern? Is it ample? Is it adequate? If adequate under normal conditions of raw water, would it be adequate under abnormal conditions? How is the treatment process controlled? Is every known reasonable precaution taken to guarantee the safety and purity of the supply? And many other questions.

Suppose you discuss the public water supply with your mayor, with your water commissioner or the water committee, as the case may be, and with your superintendent of water-works. By all means, get acquainted with your superintendent of water-works.

CAN INDUSTRY PAY DIVIDENDS WITHOUT CAPITALIZATION?

If every person makes it his business to familiarize himself more thoroughly with the facts about the public water supply, there will be no occasion for the town board to find themselves in the predicament that many town boards find themselves today, namely: the board realizes the necessity of certain water-supply improvements to adequately safeguard the public health and economic interests, but they do not dare to vote bonds to make the improvements, because the citizens in general would not favor a further bond issue.

BUMPS VERSUS BRAINS

The same citizens gladly vote big bond issues for paving; so why would they object to spending money for water-supply improvements? The answer is simple. Any person riding over a rough, muddy street concludes, without thinking, that the street should be paved. He is merely jolted and bumped to the conclusion. When

an epidemic is visited upon a community as a result of a polluted water supply, the same persons will be jolted to a realization of the fact that water-supply improvements are necessary. Many of these same persons, however, will no doubt have lost their lives in the epidemic before the survivors have been jolted to a conclusion that something must be done.

In water-supply protection, potential dangers must be recognized and cor-

rected before they become active present dangers; otherwise, we may find ourselves setting about to "lock the stable after the horse has been stolen."

Let us hope, therefore, that the reader is one who reaches his conclusions by way of thought and deduction, exercising that mental power with which only man is endowed, and that he does not have to be jolted and bumped to his conclusions.

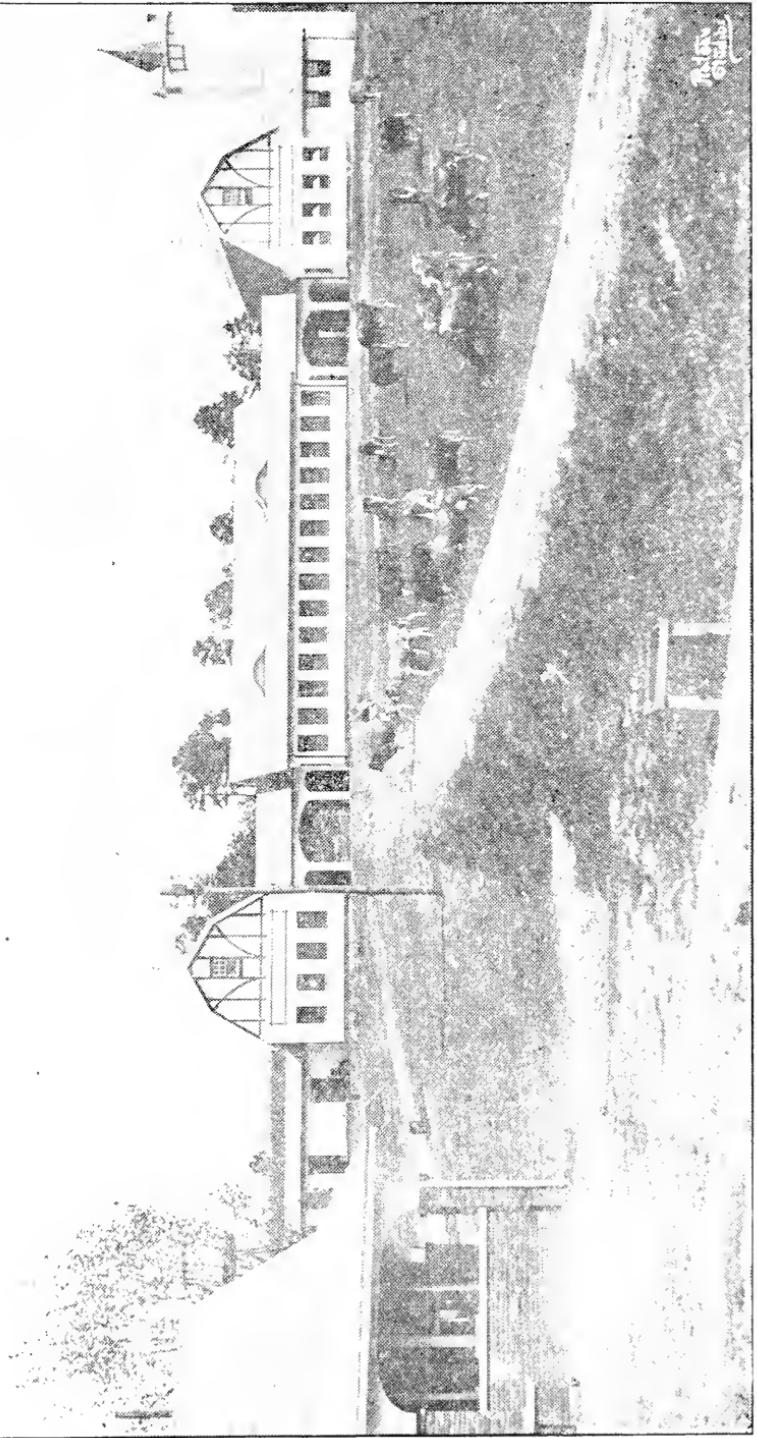
THE IMPORTANCE OF CLEAN MILK

By Frank R. Richardson, M.D.

The importance of securing clean milk for our babies and children has long since passed the stage of mere academic interest, and has assumed the proportions of a vital necessity. On the one hand, such workers as McCollum at Hopkins, Osborne and Mendal at Yale, and nutrition workers the country over have shown that the optimum diet for a healthy child cannot be attained without the use of an adequate supply of clean, fresh, healthy and wholesome milk. On the other hand, we are coming more and more to realize that milk as ordinarily produced, a mere sideline to the activities of the ordinary farm, is subject to such shocking contamination that it is not even a safe food, much less the optimum article of diet that we have claimed that clean milk is. And the broken reed of pasteurization, which attempts to but *partially disinfect* this dangerous product, has long since ceased to delude any who have seriously studied the vagaries of the pasteurizing plant. In other words, we can no longer be satisfied with such poor attempts to render dirty milk partially sterile; if we are to be safe in feeding this vital fluid to our children, we must keep it clean all the way from cow to consumer. One has but to allow his imagination a little free rein to visualize unappetizingly the possibilities of contamination always present, as he traces the milk from the udder of the untested cow, past the unwashed hands of the none too cleanly milker, into carelessly washed,

unscalded containers and strainers, to be incubated at temperatures ideal for the propagation of such of the bacteria harmful to man as may have been planted along this via dolorosa from the cow to the baby's mouth. Even boiling dirty milk does not render it clean or safe. In fact, if we are to subscribe to Victor C. Vaughn's intensely interesting hypothesis, the splitting up of these dead bacteria by boiling may make such milk still more deadly.

The obvious and entirely adequate answer to all this is, of course, Certified Milk; and it is greatly to be hoped that the time may not be too far distant when every community of any appreciable size will have at least one source of supply of Certified Milk. The fact remains, however, that at present we are a very long way off from such a year of Jubilee; and the conscientious physician, who is no longer satisfied to delude himself with our old comforting belief in the all-sufficiency of drugs, cannot wait for this day to come if he is to safeguard the lives and the health of the little ones who look to him for such protection. It is for such men as this that the following little experiment in securing better milk for babies and children—as well as for grown folks who appreciate an opportunity to get cleanliness in their milk as well as in their meat—is detailed here at some length. This article is written to prove that, whereas we can hope to get nothing better than we are willing to work



VALKYRIE DAIRY NEAR ASHEVILLE

Operated by Carolina Creamery Company for the production of Grade A raw milk and certified milk, this dairy is a model one in every respect. A herd of 35 Guernseys produces the milk which is handled in a manner that meets all the strict requirements of the American Certified Milk Association.

for, still we *can* hope to have our efforts rewarded by effective results, if we are willing to put them forth, no matter how hopeless such efforts may seem at first glance.

Experiment at Black Mountain

The little town of Black Mountain, in the mountains of western North Carolina, has a permanent population of about five or six hundred, but during the tourist season it is the center of a transient population of nearer five thousand, many of them children. A group of children's men working here, who had gotten into the habit of considering milk of known quality absolutely essential to their success, not only with babies but with older children as well, began to realize that they were in a position exactly analogous to that of a general practitioner or internist who had no knowledge whatsoever of the care and conscientiousness with which his druggist was filling his prescriptions. His situation, in fact, was decidedly less enviable; for, whereas inert drugs, though not potent to cure, are at least as a rule harmless—questionable milk has the highest sort of potentialities for evil, as witness our list of colitis, summer diarrheas, dysenteries, etc., many of which are unquestionably milk-borne. Accordingly, they began to make inquiries, and found, as is probably not at all unusual, that there was one dairy which had for a long time prided itself upon the fact that its milk had a reputation of being "good for babies." The proprietor of this dairy—not a huge one, as can readily be seen when its daily total yield of milk is set down as two hundred quarts—was approached with the following proposition: The men of the group offered to recommend his milk, at an advance in price of ten cents over the current price for all sold as the result of their recommendation, on condition that he would do his best to try to follow out such suggestions as they should make, as a result of periodical visits of inspection to his dairy. Such suggestions, on the other hand, were to be such as could be carried out without great expense.

Now this proposition is worth some rather careful study. Inasmuch as

even this enormous percentage increase in price per quart (25c instead of the customary 15c) would mean but a few dollars a day at first (\$1 when ten quarts were sold, \$2 when twenty were marketed, and so forth), it was obvious that no new equipment could be asked for. In fact, the physicians had to be content with very modest suggestions, even over and above the fact that no expensive equipment could fairly be demanded. For it is obvious that it takes much less time to milk cows with unwashed hands than to wash before milking each cow; that screening costs money; that washing teats and clipping flanks and udders and properly scalding milk containers entails an endless amount of supervision; and that everything that increases labor and time cuts down profit. And if this attempt at making clean milk available was to succeed, it must be made at least as profitable as the production of dirty milk. In point of fact, the following were taken as an ideal toward which to work this first year. Mind, I say *toward*; for, elementary as these may seem to any one whose ideas of a farm have been built up from the city man's distance, any one who has worked on a farm or dairy will recognize at once both how rare it is to find all these requirements carried out, and how nearly ideal would be the product of such a dairy, even without any expensive equipment at all.

Suggestions for Improvement of Dairy

A. *Grounds Around Stable (Milk-house)*

1. Provide mechanical means for removal of flies from cow before entering stable.
2. Cover the ground between pasture gate and in front of milk-house with ashes heavily.
3. Cover the manure trough leading from the milk-house with removable wooden cover.
4. Provide a covered receptacle at the end of manure trough.
5. Provide place for feeding cows outside of the milk-house, preferably in the small pasture.
6. Screen bench on outside of milk-house provided with a hinged cover.

B. Milk-house (inside)

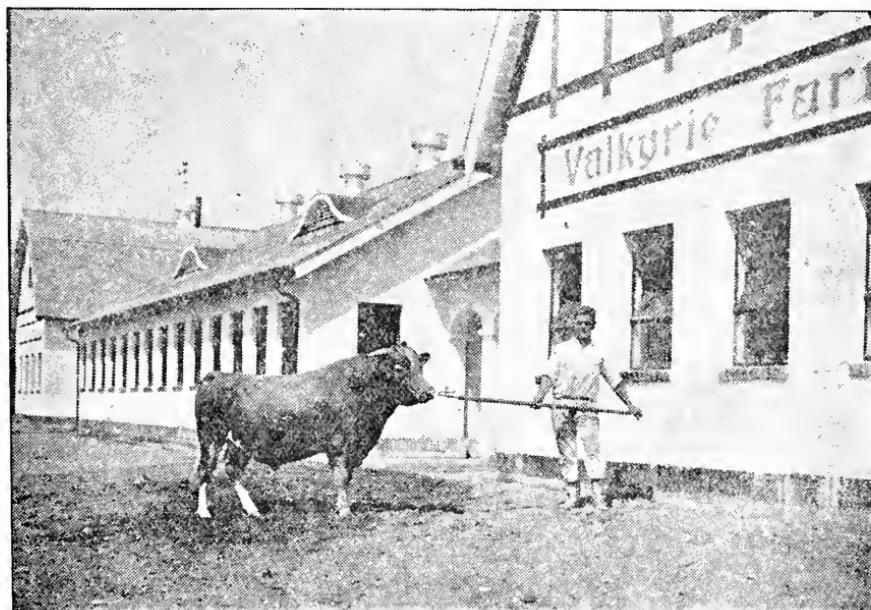
1. Stop up all cracks.
2. Cover strainers with cloth.
3. Provide better drainage for manure trough.
4. Keep all chickens out.
5. Milk into narrow-mouth pails.
6. Clean, clip and curry udders, flanks and tails.
7. Provide a tight door between the feed-room and the milk-room, and stop up all cracks between these.
8. Provide some means of tying cow's head while being milked.

4. Keep milk caps covered, and free from dirt.

5. Provide a better cooling system and later better cooling plant. At present the milk should be bottled first and then cooled. Bottle immediately.

6. Better arrangement for bottling milk. At present we would suggest that the milk be strained directly into a can, with faucet attached and bottles be filled from faucet, without a funnel.

7. Do not rinse bottles before filling. After the bottles have been

**HEADS GUERNSEY HERD**

"Chilmark," winner of many blue ribbons, heads the Guernsey herd at the Carolina Creamery Company's Valkyrie Dairy

9. Milkers to wear clean caps and gowns.
10. Do away entirely with feed-room inside of milk-house. Construct new feed-room outside of milk-house, with no other means of communication between these rooms.

C. Bottling and Cooling Room

1. Provide racks to hold bottles in inverted position.
2. Seal all cracks in room.
3. Provide a double-screened doorway for entrance.

cleaned, sterilized, and rinsed they are to be inverted in rack and allowed to dry without further rinsing or handling before filling with milk.

8. Keep the milk cans and utensils away from dust and dirt, and keep in inverted position.

9. Keep water-level in cooling trough at proper depth to cover at least two-thirds of bottles, but not to reach mouth.

10. Spring water to be tested at State Laboratory of Hygiene once a month at least.

Not "Certified," But "Inspected" Milk

Of course, with no more being attempted than this, the doctors responsible for the movement for cleaner milk had to be very guarded in their statements in recommending this product. In the first place, they had to refrain absolutely from the use of the term "Certified Milk," for this was *not* in any sense of the word certified milk, nor could it be, no matter how pure it was, by the terms of the copyright that governs the use of this term. In the second place, they could not claim that it was absolutely pure, nor absolutely safe; for even had every one of these recommendations been carried out to the letter, there was still things to be desired which were not even asked for as yet, much less guaranteed. All that they *were* justified in claiming was that they believed this milk to be much better than the average to be obtained in this section or (for that matter) in any section of the country; that they were inspecting the dairy frequently, and that they themselves, as individual householders, thought enough of the milk to pay the ten, twenty, or thirty cents extra a day that it cost them to supply their own tables with this special or "Inspected" milk, as it was called.

Results Justify Efforts

Now just what results have been obtained, after the first season's experiment? In the first place, the sale of this special grade of milk climbed steadily, during the few weeks of the tourist season that it was being recommended, from a few quarts to fifty quarts a day, which any one familiar with the fortunes of any special grade of milk will concede to be remarkably rapid progress. Second, the dairyman was so delighted with the prestige as well as the small net profit accruing to him and his dairy that he is disposing of his poorer cows, replacing them with better cattle, and planning to put in considerable new equipment for next season, in the confident belief

that he can easily dispose of his present total of two hundred quarts a day, and probably considerably more, if he can "make" it; and hard-headed dairymen are not apt to engage in unfounded optimism that involves a money expenditure. Third, the community is, even during the off season, getting a cleaner grade of milk from this producer than it was before, for when a producer has once had a vision of what clean milk means, he is far less likely to produce dirty milk. Incidentally, a new standard for milk production has been established in this section which cannot fail of good results, even though they be indirect. Fourth, the Chamber of Commerce of this town can safely advertise what is a far more valuable and desirable asset to the thoughtful head of a family, or to a panicky mother fleeing with her children from the dreaded colitis, than bracing mountain air or wonderful mountain scenery—namely, a supervised milk, inspected and vouched for by a group of children's specialists, which is in itself the surest known protection against colitis and all the rest of the list of the summer diarrheas in children. Fifth, these men have ready to their hand an article without which they are ready to confess themselves pitifully handicapped in treating both infants and older children, for boiled milk, the dry milks, the substitute foods of whatever variety, can never hope to compete for all purposes with a supply of fresh, clean, unprocessed milk, obtained from healthy cows by healthy workers. And last, but by no means least, they have demonstrated to the thoughtful producers in this community and in the section beyond its boundaries that the production of a better grade of milk can be made decidedly profitable, and so have furnished just the stimulus needed to pave the way for the introduction of real Certified Milk, than which nothing can be better, and for which of course there can be no satisfactory substitute.

"CLEAN MILK IS SAFE MILK"

TOBACCO—IS IT HARMFUL?

By W. S. Rankin, M.D.

We are so frequently asked for our opinion regarding the effect of smoking or chewing tobacco, that the following editorial appearing in the September issue of the American Journal of Public Health, and written by Dr. M. P. Ravenel, Professor of Preventive Medicine of the University of Missouri, seems well worth publishing. As will be noted, Dr. Ravenel's editorial is based largely upon the review of a book upon the effects of tobacco, whose author is Prof. M. V. O'Shea, of the University of Wisconsin.

Personally, while we have always recognized that an answer as to the effects of the use of tobacco must be a matter largely of opinion rather than of established scientific fact, we have shared what seems to be a very general conclusion that, while tobacco, considered in the large, is probably without serious effect upon adults, it is decidedly harmful to adolescents, exerting in that strategic, habit- and character-forming period of life an effect from which complete recovery rarely takes place.

However, here is the editorial, which is more satisfactory than anything that we have recently read upon the subject:

TOBACCO AND MENTAL EFFICIENCY

In 1918 a committee to study the tobacco problem was organized, with the object of collecting and publishing scientific data concerning tobacco and its effects, particularly physiological and economic. The first publication from this committee is the volume by Prof. M. V. O'Shea, of University of Wisconsin. The World War evidently had a decided effect in increasing the use of tobacco, since tobacco was given in large quantities to men in the camps, both in this country as well as in Europe. Its present use in this country amounts to nearly seven pounds per capita. The production of cigarettes has risen from three and one-half billions in 1905 to forty-six billions in 1918. The ground required for growing our tobacco amounts to

1,647,000 acres, and it is estimated that \$1,600,000,000 a year are now being spent on tobacco, exclusive of accessories, such as matches and pipes, and the fire hazards, among which smoking is recognized as a leading one.

Professor O'Shea gives his attention almost entirely to the effect of tobacco on mental efficiency. A certain amount of his testimony is derived from observation, and the opinion of men of distinction, some of whom use tobacco and some who do not. He has also studied school and college records, and finally a certain amount of material has been obtained by well-controlled laboratory experimentation.

That part of the testimony which is derived from prominent people does not seem to be of a great deal of value, although one must admit that the testimony of these people is generally remarkably fair. As a rule, however, it will be found that smokers defend the habit, and it would seem that the judgment of a person who was dependent on a drug habit would not be entirely reliable. The statement often made by smokers that it enables them to do more work and better work is probably due to the influence of habit and not to any beneficial effects of tobacco. A person, for example, who has acquired the habit of chewing gum often finds it difficult to concentrate the mind unless that habit can be practiced.

The conclusions arrived at fall naturally under two heads: The effect of tobacco on immature and mature persons. Regarding immature persons, there seems to be a consensus of opinion that the use of tobacco injures scholarship and effectiveness. School records indicate that when a pupil begins the use of tobacco his intellectual work is apt to decline. While this is not always true, the relationship between the use of tobacco and low scholarship is so frequent and well marked as to warrant the belief that we have cause and effect exemplified. Some believe that the inferior scholarship is not due to the drug effects of tobacco, but to the idle habits which smoking

tends to create. Even if this is admitted, it is evident that the influence of tobacco is just as disastrous as though it injured mental work by its drug effects. However, many reports from unprejudiced observers indicate strongly that there is a distinct drug effect which causes the deterioration in work. While there are a few dissenting opinions by those whose experience entitles them to attention, the studies made on mature persons in the psychological laboratory indicate strongly that these observers are wrong. Many large employers refuse absolutely to engage cigarette smokers, and 80 per cent of the schools whose facilities participated in Professor O'Shea's investigation have taken measures to lessen the use of tobacco by the pupils.

The investigation of Pack, made at a number of leading universities several years ago, showed that only one-half as many smokers as nonsmokers are successful in the trials for football squads. It has long been known by athletes that the use of tobacco "cuts the wind," which Pack showed to be due to a loss of lung capacity, which averaged 10 per cent. The consensus of opinion is strongly against the use of tobacco in any form by young and growing persons.

When we consider the case of mature persons, no such positive opinions can be expressed. Experiments made at the University of Wisconsin showed that the pulse rate is almost invariably accelerated; muscular control was lessened on an average of 42.12; rapidity of addition was slightly (1.04) increased, but accuracy showed a loss of 5.55. Taking the average of all psychological tests, 12 in number, there was a loss of 5.13. These tests included both smokers and nonsmokers.

Many questions cannot be answered by laboratory tests, as, for example, the effect of tobacco on creative ability, alertness, ambition, etc., and the opinions by eminent persons concerning these matters vary a great deal. In some cases, directly contradictory testimony is given, as, for example, one biologist says that most of the scientific men who lead in research are nonsmokers, while another, equally eminent, makes a directly contrary assertion. In the past, it seems that most

reformers who have created and led notable movements have been nonsmokers, whereas men who have led important political movements have often used tobacco.

The use of tobacco is of comparatively recent date, and there is nothing to show that its use has accelerated the progress of the world. No one can say that it has been essential, nor can it be held that it has been markedly detrimental to creative activity. Without question, many smokers have achieved great results, but we may ask if these same men would not have accomplished greater things had they not been tobacco users. There is equal evidence that nonsmokers have achieved notable results, and the advocates of tobacco may also ask if these same men would not have been greater had they been tobacco users. The most that can be said at the present time is that tobacco is not a barrier to the attainment of the highest efficiency on the part of certain persons, but it may be a detriment to others.

There is a considerable amount of testimony that smoking is favorable to meditation or reflection, processes in which "ideas present themselves to some extent in a chance order," those that easily harmonize with the pattern in mind being retained, while others are allowed to go their way. Professor O'Shea considers it reasonable to believe that tobacco may facilitate such a process by slowing-down the "intellectual processes just enough to permit of a certain spontaneity in the flow of ideas."

The weight of evidence is that tobacco "exerts a slight detrimental effect upon certain attitudes, feelings, or conditions affecting mental efficiency," a tendency seen only in the observation of large numbers of cases, and not marked in degree.

In conclusion, it may be said that the use of tobacco is injurious to the mental development and efficiency of the immature and growing individual, while concerning the adult no positive opinion can be expressed, remembering, however, that laboratory tests show that in almost every reaction tried, twelve in number, tobacco had an injurious effect.

THE INTER-RACIAL COMMISSION AND PUBLIC HEALTH

By Mrs. T. W. Bickett, Chairman Woman's Committee

The Commission on Inter-Racial Co-operation is a national organization with headquarters at Atlanta. It has no official connection whatever with any other organization. W. W. Alexander, John J. Eagan, Ashby Jones, and Mrs. Luke Johnson are officers of this organization. The personnel consists of a number of governors of the Southern States—bishops, college presidents, heads of women's organizations and a number of thoughtful, forward-looking men and women of both races. This Commission has State inter-racial committees in practically all of the Southern States and in eight hundred of the counties. These State committees are composed in most States of the best and wisest of the white and negro people in the various communities. Dr. Poteat, of Wake Forest in chairman of the N. C. State Inter-Racial Commission. The thoughtful white men and women of this commission, conscious of the fact that as those in authority, and rightfully so, we cannot escape our responsibility towards a dependent race, are standing for justice and fair treatment for the negro, are standing against mob violence, and for wider opportunity for his development mentally, morally and physically.

This organization believes that there should be a definite health program for the negroes of the country, and the Commission on Inter-Racial Co-operation is urging through all organizations, missionary, State and civic, the co-operation of the white people in carrying out this program.

A very wise person once said that he would have written over the doorway of every school "Mens Sana In Corpore Sano." I should like to see it written not alone over the schools, but over the doorway of every home and in the hearts of every man and woman, black and white, in North Carolina.

While many of us know the power that has come from those whose bodies

are frail and diseased, we realize that it has come in spite of this frailty and that it has been through unnecessary pain and travail that these souls have won their handicapped way. Intelligent, forward-looking people today are emphasizing the necessity of making every child a healthy animal first.

Those who think and read and have the advantage of association with very wise folks are realizing the necessity for prevention rather than treatment of disease. Expectant mothers are realizing the necessity for early and frequent examination by a physician during pregnancy. They are realizing the importance of proper food, fresh air, plenty of water, diversion, and the cultivation of a cheerful, happy frame of mind. Mothers are realizing the value of nursing their babies; of having them examined often by a physician; and the importance of keeping themselves in good condition that they may give to their children a richer gift than bonds or gold—the gift of a happy, healthy mother. Intelligent folks are everywhere realizing the importance of the pre-school age—the years from two to seven—when the foundations are being laid. They are realizing the importance of keeping the children away from contagious disease, of periodical examinations, the early treatment of diseased tonsils and adenoids, defective sight or hearing and other weaknesses or diseases, including tuberculosis and mental deficiencies, in their incipient stages. They are realizing the importance of sanitary surroundings, of light and air, and well-ventilated school and public buildings.

Intelligent people are realizing these things and many more that tend to make better babies and mothers, stronger boys and girls, and more efficient and happier men and women. But what of the unlearned, the unprivileged, those who are ignorant of even the elementary rules in regard to the care of themselves, their chil-

dren and of the protection of the community. Every section of the country has such a problem along health lines with which it has to deal. In the North and the East this problem has to deal with immigrants from Russia, Serbia, Italy and many disease-infested regions of the East. In California it has to reckon with the Japanese and Chinese. In the South the problem which most largely affects our health program is that of the negro. Because of insanitary surroundings, lack of training in health education, and often because of inherited and acquired weaknesses and disease, the negro is often a real menace to the community in which he lives.

In a beautiful home in Alabama the only and idolized son of a devoted father and mother lay desperately ill with scarlet fever. Aunt Mandy, the washerwoman, who came for the clothes was told by the mistress of the house that she would not send out the clothes that week because she was afraid that Aunt Mandy's children would take the disease from her little boy. "Lor', honey," said Aunt Mandy, "Don't you mind 'bout dat. Dem chil-lern has all done had it and is all well 'cept Mary Jane, and she's done daid." Miss Susie's kindness was no more effective in preventing the disease reaching Aunt Mandy's children than was Aunt Mandy's ignorance in bringing that disease to Miss Susie's home.

In another home there was a splendid young couple and a fine baby boy. The baby grew pale and had fever. They took him to a physician and he pronounced it tuberculosis in an advanced form. The little boy died and later it was found that the nurse was afflicted with the disease and that she had come from a home in which two had died and one was at that time confined to his bed. Other instances of loathsome contagious diseases contracted by innocent members of families have been multiplied in medical reports.

And Joseph said to his brethren, "Ye shall not see my face except your youngest brother be with you." These words that have come ringing through the centuries have for us today a very real significance. In seeking health, happiness, or any good things for our-

selves and our very own alone, we often lose the very thing for which we labor and sacrifice. In the olden days there was said to be a dragon who came each night from the swamps about the city choosing for himself the most beautiful of the maidens, and though the people of the city kept watch day and night it was not until the dragon was slain that the maidens were safe. So today, build as we may about our loved ones barriers and bounds we cannot be sure that they will escape. From without, from the places of ignorance and vice, from "Fried Meat Town" and "Coon Hollow," come contagion and disease, often bearing away our fairest and our best. Truly it is today as of old, "Man cannot live to himself."

The Inter-Racial Commission, realizing not only the menace that this ignorant, diseased population may be in a community, but feeling keenly the white man's obligation as his brother's keeper, is urging the organized co-operation of the white people with the negroes in stressing an intensive health campaign. It is seeking through State and county inter-racial committees, through civic organizations, women's clubs, parent-teacher associations and missionary societies to encourage conferences along health lines. It is urging the white people as those in authority to meet and confer with intelligent negroes of the community that together they may work out an adequate health program. In this program it is urging co-operation in making negro health work effective in an educational way; it is urging a study of negro community life, housing, sanitation, neighborhood conditions, and is seeking to enlist every influence for bettering these conditions. It is urging instruction for the mothers in regard to care of themselves and their babies, of examination and treatment of school children and is using every possible means to impress upon the negroes of the community the importance of health education both for their own development and in the interest of the community.

Sir Launfal set forth from his castle upon a quest for the Holy Grail. Appareled in magnificent attire with gleaming armor and shining sword,

and mounted upon his magnificent white charger, he dashed forth upon his quest. At his gate a leper sat begging alms and mercy from his lord. Tossing a coin the knight dashed by, leaving the beggar in his misery and pain. Many years passed. Sir Launfal did not find the Holy Grail. Ragged, on foot, and with his possessions taken from him, he came again to the castle gate. The leper sat still in his filth, disease and rags and lifting up his voice he begged alms and mercy of the night. Sir Launfal had but a single crust, his bottle was empty, but he broke the crust and gave to the suffering man. He brought water from the brook and gave to the thirsty one to drink, and as he broke the bread and gave the water, he saw in the ragged beggar at his feet the Master's face and heard these words: "Who gives himself with his gift feeds three, himself, his hungering neighbor and me."

MEDICAL EXAMINATION OF CHILDREN

We are quoting below an article written by Dr. E. R. Hardin, Health Officer of Robeson County, and published in a recent issue of the Lumberton Robesonian. This article is simply one of the many that Doctor Hardin has written recently for his local paper, on the various problems demanding the mutual attention of health department and public. It is an illustration of one of the numerous ways in which a real health officer may be of service to the people.

"During the last three years thousands of school children in all parts of the county have been examined, and letters have been sent to hundreds of parents telling them what defects their children had, and advising proper treatment. A great many of these children had diseased tonsils and adenoids, many had defective vision, others defective hearing, hookworm disease, and other defects; over half had bad teeth. A large number of these children have been treated by the specialist and dentist, and in various clinics, but the majority of them have not had treatment.

"There are hundreds of children in the county who need their tonsils and

adenoids removed, or proper glasses fitted. The parents of some of the children are indifferent, others have not been able to have the work done, and still others put it off because of fear or a notion that the child is all right or if there is any trouble, will outgrow it. The sad part of it is that they do not outgrow these things, or at least the deformities and defects that follow them in after life.

"Parents who have put off having their children's tonsils and adenoids removed, or having proper glasses fitted to correct defective vision, should do it now without further delay. It will mean the removal of a defect that handicaps the child through life, and will enable him to do creditable work in school this session, and the years to follow. The time to have diseased tonsils and adenoids removed is when you find that your child has them, if the future welfare and happiness of your child means much to you.

"Parents who for any reason are absolutely unable to have their children operated on should see the health officer, and some arrangement will be made to take care of such cases. Many of these children should have had their tonsils and adenoids removed two or three years ago; and parents who have been notified by the health officer, and have not had their children treated, will do well to give this matter prompt and serious consideration. If in doubt, ask the advice of your physician, of the specialist, but do not pass it up any longer for the child's sake."

CHURCHES AND HOSPITALS

The Baptist people recently completed and opened a large hospital in Winston-Salem that will be conducted under the auspices of that denomination, and active work is under way by the same denomination to establish a hospital in Charlotte. Dr. B. W. Spilman, president of the Baptist State Convention and field secretary of the Southern Baptist Sunday School Board, declares that the North Carolina Baptists should establish at least six hospitals, including those at Winston-Salem and Charlotte, in different sections of the State. This is

cited as gratifying evidence of the fact that the religious people are realizing that it is a part of the work of Church to minister to the sick; they are realizing that establishing and maintaining hospitals is not only a necessary and important part of the Church's work from the humane standpoint, but that hospitals are, for obvious reasons, an asset to the Church. The Roman Catholic Church realized that long ago and has utilized that agency in gaining adherents. The Protestant Church has utilized the same agency in the larger cities in this country and in foreign mission work, but it was not until recent years that the work has been taken on in North Carolina.

Not long ago a physician engaged in public health work, appealing for help for tubercular victims by the establishment of hospitals locally or through increased facilities at the State institution at Sanatorium, declared that while church property in North Carolina is exempt from taxation, not a single church had endowed a bed for the treatment of tubercular victims. As this physician saw it, the Church, accepting aid from the State in the form of tax exemption, had failed in its duty and neglected a great work in its failure to come to the aid of the State in saving the lives of the tubercular infected, who can be saved if they receive proper treatment in time. There is reason to believe that the Church is awakening to its duty in this respect. The Baptist people, the largest in numbers and aggressive in good works, are stressing the construction of hospitals. Other denominations that have already done some work in that line will doubtless increase their efforts, and others as yet unrepresented with hospitals will follow in their wake.

It is but fair to say in behalf of the churches in North Carolina, however, that their struggle through the years has been to provide and maintain educational institutions. They have done and are doing a great work in education. They did that work when the State was unable to do it; and they are continuing it, doing a great and necessary work, essential both to the welfare of the Church and the State; for, notwithstanding the great

development of State schools, the State cannot take care of the educational work alone, and should not be permitted to do so.—Statesville *Landmark*.

ENGINEER DUFFY

For twenty-five years Glen E. Duffy, of Terre Haute, Ind., has been a railroad engineer. He drives the locomotive on a crack limited train. It is a task requiring quick hands, nerves of steel, and an active brain. It's a man's job.

In the twenty-five years Duffy has piloted an engine, through all possible weather conditions and countless other trying tests, he never had an accident until last Sunday. On that day his train struck an automobile and killed four persons; a little later it struck another and killed nine. He picked up the bodies of three children from his locomotive. Duffy has a boy of his own, twelve years of age.

"We get a dozen scares a day," the shaken engineer told a reporter. "Two weeks ago a fellow with a girl dashed across in front of us. We didn't miss him a yard. My fireman's face was ashen as he turned to me and whispered, 'We didn't hit him.'

"Sunday is our day of dread. I do not like to go out on my engine on Sunday. Every engineer feels the same way. But we go, even though we're sick or shaken from accidents. We know the road. We couldn't rest with some one else driving our engines."

Duffy, guardian of the lives of hundreds daily, a man as true as the steel his great machine rides, is plunged into tragedy which makes him heartsick. He was in no way to blame, yet he is haunted by the catastrophe. He is a family man; his sympathies are profoundly stirred. He was vigilant, yet his care and watchfulness availed nothing against the other man's carelessness. One cannot help being deeply affected by his story.

"Sunday is our day of dread," he says.

Motorists ought to keep that thought in mind.—Rockford, Ill., *Register-Gazette*.

OUR NUTRITIVE PAST

PROPER NUTRITION may depend not only on what we are eating now, but on what we have eaten in the past, according to discoveries made recently at the University of Wisconsin. These indicate that certain organs of the body may store up vitamins, so that one may get along very well for a time on a non-nutritious diet, provided he has eaten the proper food at some previous time. This, we are told by an editorial writer in the *Journal of the American Medical Association* (Chicago), may explain various hitherto irreconcilable facts regarding the behavior of animals in special dietary conditions. It is now generally agreed, the writer says, that vitamins cannot be manufactured by animal tissues; we are dependent for them on outside sources. While it is commonly asserted that the vitamins are indispensable for nutrition, the writer admits that there is considerable uncertainty involved in the evidence at present available. One species of animal will apparently thrive on a food mixture which leads promptly to deficiency symptoms in another. He says:

"For example, the rat may grow well on diets which speedily lead to scurvy in the guinea pig, even under comparable conditions. Man and the monkey, like the guinea pig, are peculiarly susceptible to the lack of the anti-scorbutic vitamin. In respect to rickets, man, the rat and the dog all seem to be affected by the lack of the 'principle' contained in cod liver oil as well as many natural foods. On the other hand, human beings do not frequently, if ever, show the ophthalmias that are so characteristic of a regimen deficient in vitamin A, in the case of various other species.

"How are such seemingly conflicting facts to be reconciled with any

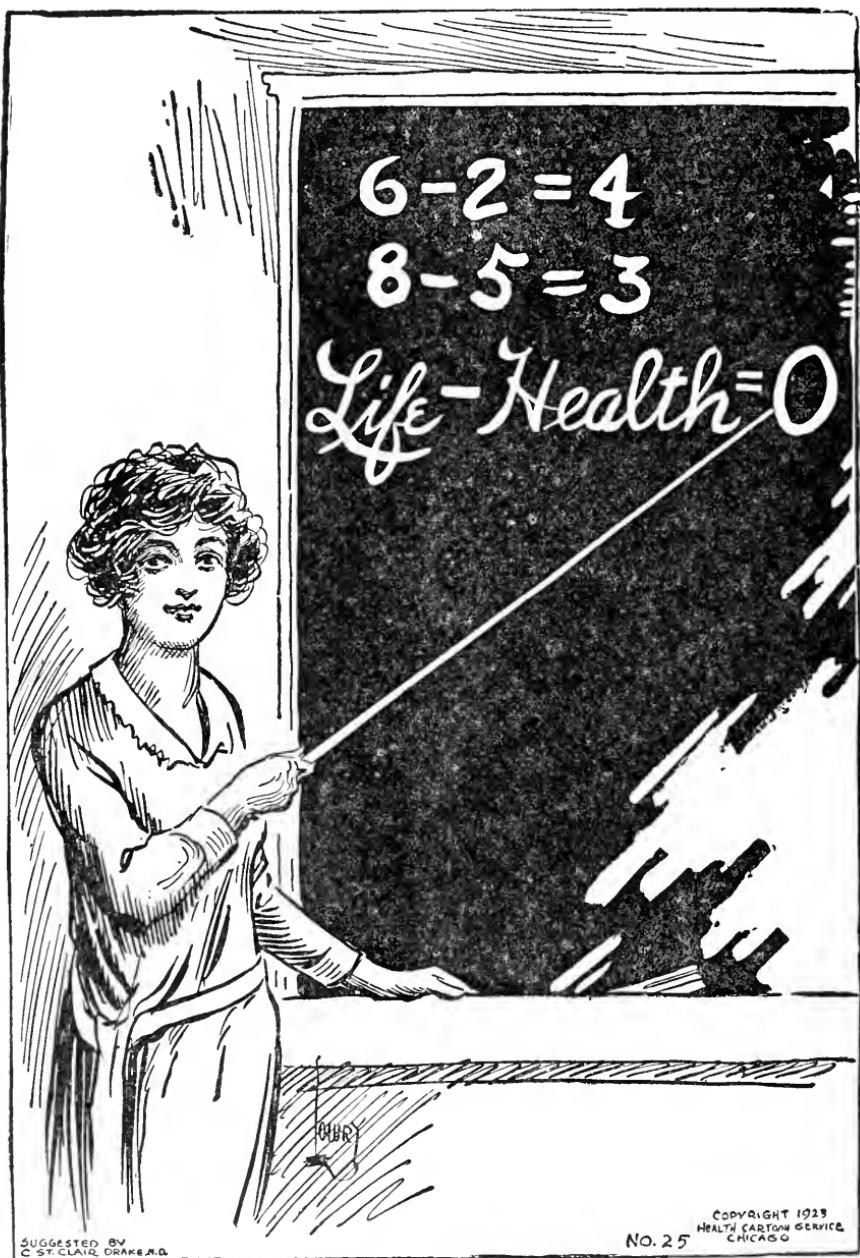
hypothesis of the indispensability of the vitamins for well-being? The foremost suggestion is that not all of the now recognized types are essential to all species of animal organisms. This is perhaps not more surprising than the marked differences in the susceptibility of various species to certain infections, and their variable equipment of protective 'immune bodies.'

"New light has been thrown on the questions at issue by the demonstration that the fat-soluble vitamins, at least, can be stored in some measure in the body. Consequently, individuals may continue for some time to thrive on a diet admittedly poor in these food factors. According to the studies at the University of Wisconsin, the liver appears to be an important center of this storage. An organism may become so enriched through an earlier dietary regimen that it can continue in health for some time on the 'accumulated surplus.' Clinicians have frequently commented on the fact that few, if any, authentic cases of ophthalmia due to vitamin deficiencies have been reported for man. Evidence has even been offered showing the lack of symptoms in a number of children receiving a diet of skimmed milk for months. Here, we are now reminded, undoubtedly two factors were operative: in the first place, skimmed milk is not entirely devoid of fat-soluble vitamins; and, in the second place, considerable amounts may have been drawn from stored reserves. These findings afford another illustration of how proper living helps to fortify us against exigencies that may come without anticipation or defense. Like our 'infectious past,' our 'nutritive past' may mean much for future welfare."—*The Literary Digest*.

IS YOUR LITTLE CHILD SAFE?

Last year in North Carolina 508 little children needlessly died of diphtheria. This dread disease of childhood can always be cured if antitoxin is administered promptly after the onset of the disease. But—diphtheria can be prevented by giving the child toxin-antitoxin. Be safe. Protect your children. See your physician.

Everything is Nothing—Without Health



APPRECIATED MOST BY THOSE WHO HAVE
LOST HEALTH—THEN IT IS TOO LATE

MR. CHAS. T. WOOLLEN,
CHAPEL HILL, N. C.



The Health Bulletin

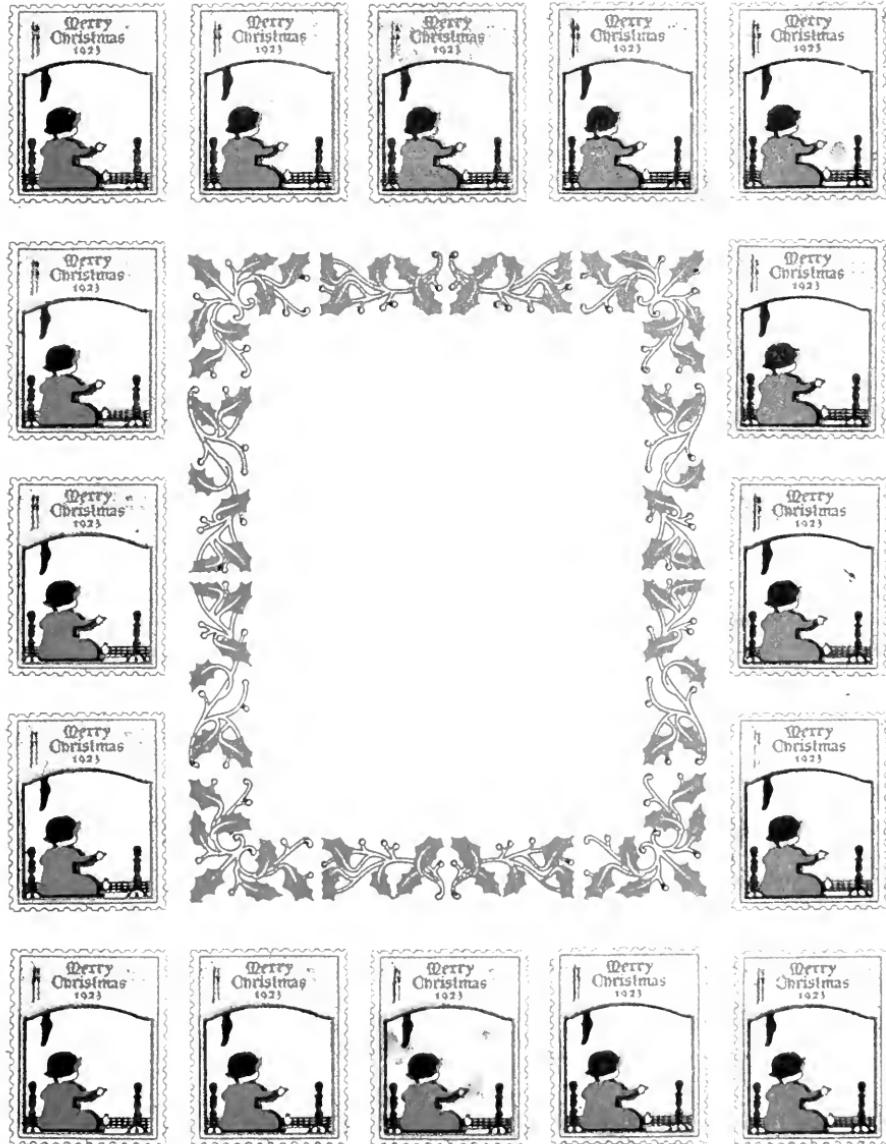
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This Bulletin will be sent free to any citizen of the State upon request!

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No. 12



NO TUBERCULOSIS
IN NORTH CAROLINA IN 1933

LET'S FINISH THE JOB

IT'S HALF DONE IN TEN YEARS

LET'S FINISH IT IN THE NEXT TEN

There were 4,800 deaths from tuberculosis in 1913; there were 2,369 in 1922.

Tuberculosis cost the people of North Carolina one hundred million dollars in 1913; it cost fifty millions in 1922.

Fifty millions saved in 1922, but still losing fifty millions annually.

THE FIGHT IS EVERYBODY'S FIGHT

Buy Tuberculosis Christmas Seals and
Help Finish the Job.

IT CAN BE DONE!

NORTH CAROLINA
TUBERCULOSIS ASSOCIATION
SANATORIUM, N. C.

THE Health Bulletin



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SUCCESSFUL SIDE OF TUBERCULOSIS WORK REACHED

Dr. Linsly R. Williams Reviews Causes for Decline of Death Rate

That the pleasant side of tuberculosis work has been reached—the place where success is evident—and the causes underlying the success of the great movement, were the subjects discussed by Dr. Linsly R. Williams, of New York City, managing director of the National Tuberculosis Association, in his address before the North Carolina Tuberculosis Association at its third annual session in Durham, October 30.

The decline in the tuberculosis death rate during the last twenty years, which has been large in amount and continuous in character, afforded the grounds for Dr. Williams' optimism and gave rise to his prophecy that within thirty more years the tuberculosis situation will have been brought under control. The fact that there has been no backsliding, that there has been no swerving in the program, or faltering in the decline of the death rate during the twenty years of effort to bring about its control, has been most gratifying to all agencies at work on the subject.

The success that has been attained thus far, thinks Dr. Williams, is due to the fact that there has been but one program followed by all the agencies at work for the control of the disease, and that is the program adopted by the National Tuberculosis Association, which is identically the same as the one that has been used from the beginning by the North Carolina State Sanatorium and the North Carolina Tuberculosis Association.

This is aimed first toward finding the large number of individuals who have broken down with the disease, to strengthen their resistance and to make them well again, if possible; and second, to prevent their infecting others. This has meant, of course, the establishment of such institutions as the tuberculosis clinic, the training of many physicians in the technique of diagnosis, and the building of sanatoria for the care of early cases, and the segregation of those individuals who, having broken down, might become a source of danger to others. The emphasis of the program, said Dr. Williams, has been placed where it could be most effective: namely, in the constant improvement of the status of human beings. The campaign at all times has attempted to make the lot of men and women happier and easier, to improve their personal hygiene, to remove possibilities of gross infection, and to give many individuals a fighting chance to throw off disease which they would not otherwise have in their usual methods of life.

As a matter of fact, Dr. Williams attributed some of the favorable changes that have been brought about in the last two decades in the United States to the improvement in the racial constitution of the people. He said: "In America we see clearly evidences of remarkable improvement in the status of the great mass of people; the bettering of the conditions under which they must work; the shortening of their hours of labor, and the in-

crease of their earnings. From every angle, there is good evidence that the population of America is better off."

On the other hand, Dr. Williams showed that the losses that have been sustained in the tuberculosis movement in Europe have been clearly related to the marked retrogression in the well-being of the European people.

But cutting the national death rate almost in half in twenty years, Dr. Williams reminded his hearers, is not

finishing the job, is not half finishing it, as the last half of the journey is more difficult to make than the first. The tuberculosis movement, he said, must not rest on its laurels, nor be allowed to drift along easy ways. He said that while the disease is on the decline, this is an opportune time to apply even greater energy along approved lines, that there may be no diminishing but rather cumulative returns in life saving.

THE DREYER TUBERCULOSIS VACCINE

The following editorial from the Journal of the American Medical Association, July 14, 1923, according to Dr. C. A. Shore, director of the State Laboratory of Hygiene, contains all the known scientific facts in regard to work being done by Professor Dreyer, of the Department of Pathology, Oxford, England, in an attempt to produce a vaccine that will cause an immunity to and cure for tuberculosis:

"Newspapers have carried extended notices of the Dreyer so-called 'defatted' tuberculosis vaccine. Many inquiries have been received, indicating that, with ever-watchful hopefulness, physicians and patients are still alert for news of any promising announcement of a successful specific treatment for tuberculosis. The complete report of the researches conducted by Professor Dreyer, of the department of pathology in Oxford University, appears in the British Journal of Experimental Pathology for June, and an extensive abstract is available in the British Medical Journal for June 23, 1923, both just received.

"It has long been known that the tubercle bacillus has a coating of waxy or fatty material, generally called lipoidal substances. Experiments conducted in this country and elsewhere seem to indicate that the virulence of organisms rests, to some extent, on the concentration of such lipoids in their coats or capsules. As Dreyer says, 'there was an *a priori* probability that the failure to produce immunization was due to them.' It seems quite possible, as Dreyer reiterates, that these substances protect the specific bacterial proteins and prevent their lib-

eration from the body of the bacterium, thus checking or completely stopping the production of the sole adequate stimulus of the immunity reaction of the infected body. In view of these facts, it was determined to attack the problem by attempting the removal of the lipoidal elements from various bacterial organisms of the acid-fast and gram-negative types. Such organisms are commonly prepared for staining by treatment with formaldehyde and acetone, and the British pathologists were able to devise a method for the preparation of 'defatted' antigens, using these two substances. The method is thus described:

"Tubercle bacilli are grown on the surface of glycerin broth or other suitable liquid mediums for two or three weeks. The fluid is decanted off and the organisms are ground up in a mortar with a few drops of liquor formaldehyde. More formaldehyde is gradually added with constant grinding until from 150 to 200 c.c. of the liquor formaldehyde have been added to each 5 grams of bacilli weighed wet. This suspension is heated in a flask to 100 C. for four hours, filtered, and the residue washed three or four times with acetone. The suspension is then filtered through calcium-free paper, and the residue extracted three or four times with acetone and then in a Soxhlet apparatus. The insoluble residue is dried and ground in a sterile mortar. A weighed quantity is ground up with sterile saline solution to a paste, more saline being added during the grinding. It is then centrifuged. The supernatant fluid is pipetted off and, when diluted with saline, containing formaldehyde, constitutes the

antigen suspension. There are, of course, many details of standardization and measurement of dosage to be observed, and these are given in full in the complete article.'

"In brief, such experimental evidence as is available indicates that the injection of this antigen produces anti-substances in the serum which are demonstrable by test-tube experiments. Four guinea pigs subjected to experimental tuberculosis seemed to show signs of immediate healing when treated with the vaccine. Finally, it is the opinion of Drs. Paul Fildes and G. T. Western, after observation of sixty patients treated in the London Hospital with the new antigen, that 'improvement has taken place in nearly all cases and is, in our opinion, of the order which exceeds obviously that obtainable by any other form of treatment which is applicable to these conditions.' It was also their opinion that the specific vaccines prepared by this method and used in six cases of streptococcal infection, seventeen cases of staphylococcal infection, and five cases of gonorrhea, produced results which compared favorably with pre-

vious experiments with vaccine-treated cases but which were not so interesting as those with the tuberculosis cases.

"The waxy capsule of the tubercle bacillus has long excited the interest and curiosity of research workers. In their excellent compilation of the chemistry of tuberculosis, Wells, DeWitt and Long trace these investigations through the literature of many countries. Last year Long and Campbell determined the proportion of total tubercle bacillus lipin present as wax, and immunologic experiments seem to indicate that the virulence of the organism bore some relation to the amount of wax in the capsule. In fact, experiments have been made with vaccines made from the waxy portion of the organism.

"It is unnecessary, of course, to remind our readers that this work is in the experimental stage, at least so far as it concerns the treatment of tuberculosis. The experiments are scientific and have good theoretical basis; future developments will be observed with great interest."

WOULD RAISE \$50,000 FROM SEALS THIS YEAR

Fifty thousand dollars to be raised from the sale of Tuberculosis Christmas Seals this year is the task to which the North Carolina Tuberculosis Association has set its heart and hand. While this task will fall for the most part on the one hundred and fifty local seal-selling organizations in the State, it will call for the co-operation of all the people, of all social, civic and philanthropic organizations to make it a success.

Last year the seal sale of the State amounted to \$43,093.51. Members of the State Tuberculosis Association believe that this amount can easily be increased to \$50,000.

The National Tuberculosis Association has set \$5,000,000 for its goal, and a report from national headquarters says that never in the history of the campaign to fight tuberculosis has there been such a demand for Christmas Seals, Health Bonds and other supplies used in the seal sale. Nearly one million dollars worth of seals in

excess of the total requirements for 1922 have been ordered for distribution throughout the States. It has been predicted that the 1923 seal sale, not only in North Carolina but in all the States, will surpass all previous records in financial returns. There is an increasing tendency on the part of all organizations selling seals to view the seal-sale campaign as an integral part of the year's work. Consequently more business-like methods, as well as trained workers, are used in the work.

The seal-selling organizations in North Carolina are composed of the leading women and men in their communities. In Durham the health department of the Woman's Club, with Mrs. J. H. Epperson as chairman, will have charge of the seal sale. In Raleigh, the department of health of the Woman's Club, with Mrs. Virgil St. Cloud as chairman, will have charge of the sale. In Asheville, Mrs.

J. M. Gudger, Jr., with a committee of business men and women, will be responsible for the sale of seals.

The value of the seal-sale campaign to the tuberculosis work in the State cannot be over-estimated. It has become a State as well as a national in-

stitution and is here to stay. Each year from Thanksgiving to Christmas the Tuberculosis Christmas Seal, the messenger of hope to thousands, brings the true Christmas message, "Do unto others as you would have them do unto you."

CLUB WOMEN OF STATE PLEDGE SUPPORT TO WORK OF PREVENTING TUBERCULOSIS

For a number of years the North Carolina Federation of Women's Clubs has given a whole-hearted support to the tuberculosis work of the State. They have been faithful in upholding the hands of those on whose shoulders fell the burden of carrying on the fight. Their sympathetic co-operation was again pledged at the recent meeting of the North Carolina Tuberculosis Association in Durham by their representative, Mrs. Charles E. Platt, of Charlotte.

In a paper read by Mrs. Platt at the Durham Conference she outlined a program of health work which the club women of the State will undertake during another year.

A program of lectures on the subjects of cancer and tuberculosis will be given by experts during the year before women's clubs and other organizations. These lectures will be illustrated by lantern slides.

An effort will be made to improve the housing condition of negroes, which is probably one of the greatest public health menaces in the State today. To eliminate the danger that

arises from close contact with maids, cooks, and washerwomen who come from these homes, the club women say they will lend every effort of mind and energy.

During the month of December the sale of Tuberculosis Christmas Seals will be given their full support. Many clubs throughout the State are today maintaining nurses as a result of the sale of these little messengers of hope.

Open-air schools and fresh-air camps are two features of health work for children that have had the support of the club women. Other movements affecting the health of the child that are endorsed by the Federation of Women's Clubs are inspection of school children and the Modern Health Crusade work, including the work done with under-nourished children.

In conclusion, Mrs. Platt said: "We shall continue to help in every movement for the promotion of health and try to develop a public opinion that will demand for North Carolina every measure that science and experience can suggest for the control and prevention of tuberculosis."

NORTH CAROLINA SHORT 2,000 BEDS, ACCORDING TO NATIONAL STANDARD

In twenty years the tuberculosis institutions of this country have increased from three State institutions to fifty-eight, and from 8,000 beds for tuberculous patients to 66,000. This most remarkable development is shown in the directory of tuberculosis institutions recently issued by the National Tuberculosis Association and dates back to 1904 when the first directory was published.

One of the fifty-eight State institutions is in North Carolina and 2,048 of the 66,000 beds. At the North Caro-

lina State Sanatorium there are 200 beds for white people and 64 beds for negroes; at the Guilford County Sanatorium there are 64 beds; at the sanatorium in Forsyth County there are 30; while at the 26 private sanatoriums in the State there are 490. In addition, the United States Government maintains a hospital for tuberculous patients in North Carolina which has a capacity for 1,200 patients.

But even with 2,048 beds for tuberculous patients, North Carolina is still short about 2,000, according to the

standard set by the National Tuberculosis Association, which is one bed for every annual death. There were 2,586 deaths from tuberculosis in North Carolina in 1922. Since the 1,200 beds at Oteen are not available to North Carolina patients unless they served in the World War, and since the 490 beds of the private sanatoria are used for the greater part by people from other States, there are only 358 beds for public use in both the State and county sanatoria. This leaves a shortage of nearly 2,000 beds, or one bed to every seven patients.

A well-equipped sanatorium for treating tuberculosis is now recognized as a most important essential in any

well-planned program for combatting tuberculosis, be it a State or county program. Its chief value is not only in prolonging life and diminishing suffering and disease, it has a distinct educational value that is necessary to effective treatment. The time has come when counties or groups of counties must provide sanatorium treatment for their tuberculous sick. The ideal would be a bed for every annual death from the disease. The State, too, must make provision for an increase in the number of beds in order to meet the needs of its suffering citizens. By no other means can the State hope to get control of the tuberculosis problem.

NORTH CAROLINA'S IMPORTANT PROBLEM—TUBERCULOSIS AMONG THE NEGROES

"For us in North Carolina there is no problem that is so important as tuberculosis among the negroes and what we can do for it," said Dr. W. L. Dunn, in discussing Dr. J. W. Walker's paper on the "Negro Division of the North Carolina Sanatorium for the Treatment of Tuberculosis," read at the Durham Conference. Continuing, Dr. Dunn said:

"Dr. Walker is doing a big work and standing out for medical ability. He is helping to solve this problem. He incidentally referred to the fact that he was in Asheville for twenty years and that perhaps Dr. Minor and I helped him in his work. I want to say that if we really helped him in this work we both feel that one of the greatest contributions we have been able to make to the State of North Carolina is in being able to help Dr. Walker to do this work among his own people. This man has done a tremendous work among his people, not only in tuberculosis but in a general way, and we have always been glad that we have Walker, and we were

particularly glad in Asheville to see him go to the Sanatorium—glad because we felt he would do a greater work for his people.

"Dr. Walker's work has convinced me, and also my good friend Dr. Minor, that the pessimism about the treatment of tuberculosis among colored people has not been justified. We are both perfectly certain, and he must also be, that tuberculosis is not so easily treated and curable among the negroes as among the whites. I bring it out for this reason: we are starting this work in North Carolina, and if we get the idea that it is as easily handled among the negroes as among the whites we shall not get good results. We shall get results, but let us not expect too much; let us not be disappointed if we do not get as good results as have been gotten at the State Sanatorium.

"There is one more point—the diagnosis is rarely made early, the case is not seen by the skilled doctor early enough, so he is not gotten in the easily-handled stage."

BUY TUBERCULOSIS CHRISTMAS SEALS

STEADY GROWTH OF TUBERCULOSIS CAMPAIGN

The growth of the Tuberculosis Christmas Seal campaign and with it the development of the organized tuberculosis movement in the United States present some of the most interesting phenomena of education and organization in social work anywhere on record. Within less than fifteen years, largely through the influence of the Christmas seal, the tuberculosis movement in the United States has been carried to the remotest hamlet of the country.

A catalogue of the number of tuberculosis-fighting agencies at the present time would include more than 1,200 State and local tuberculosis associations, many of them with full-time executives and with a State association in every State; over 700 tuberculosis hospitals and sanatoria with an aggregate bed capacity of 60,000; nearly 600 tuberculosis clinics and dispensaries; several thousand open-air schools and fresh-air classes; and a daily increasing number of public health nurses devoting their attention to tuberculosis. Of the 10,000 public health nurses now in the field, it is estimated that at least one-third are giving all of their time to tuberculosis. Besides these definite agencies, one might speak of local and State boards of health that have been reorganized and put on a business basis, of hundreds of county and municipal full-time health officers who have been secured, of ordinances and laws that have been put on the statute books and enforced, of millions of pages of printed matter and other educational material distributed broadcast throughout the country, and of an aroused public interest in tuberculosis in all kinds of groups—civic, political, commercial, social, religious, etc.

THE TUBERCULOSIS CLINICS

The tuberculosis clinics that have been conducted for the past three years by the North Carolina Tuberculosis Association will be resumed January 6, 1924, after a lapse of a few months caused by the resignation of Dr. J. L. Spruill, who has conducted these clinics with marked success from their

establishment. Dr. Spruill resigned to become superintendent of the Guilford County Sanatorium and director of the tuberculosis work in Guilford County.

Dr. D. R. Perry, of Lexington, formerly health officer of Davidson County, succeeds Dr. Spruill as clinic physician. He is now engaged in a course of special study preparatory to entering actively into field work.

TUBERCULOSIS

One of the most encouraging evidences of improvement in the public health is to be found in the rapid decrease of tuberculosis. In the November issue of *Hygeia*, Dr. Alfred Henry discusses in easily intelligible terms the symptoms, the treatment, and the prospects for recovery. Strange as it may seem, he says, tuberculosis is a disease that is more understandable than almost any disease of mankind; yet the majority of people probably know less about it than about almost any other common infection. The chief reason for this peculiar state of affairs is probably the fact that most people have not yet been acquainted with the simple facts of the cause and cure of the disease. The earliest important symptoms are languor, afternoon fever, cough, possibly expectoration, loss of appetite and loss of weight. The disease is contagious but not hereditary. The contagion can readily be controlled by reasonable care and self-control. Tuberculosis is just as curable as many other common diseases, but it is not cured by drugs. The cure lies in five things: rest, fresh air, nutritious food, a satisfied mind and proper medical attention. Success depends more on the whole-hearted co-operation of the patient than it does on the physician.

"HEALTH TRAINING IN SCHOOLS" —A HANDBOOK FOR TEACHERS

"Health Training in Schools" is a handbook for teachers and health workers. It was prepared for the National Tuberculosis Association by Miss

Theresa Dansdill in consultation with Dr. Linsky R. Williams, managing director of the association, and with Mr. Chas. M. DeForest, crusade director. It is bound in cloth and costs \$1. postpaid. It is now on sale by the North Carolina Tuberculosis Association, Sanatorium, N. C.

This handbook presents a complete course of health lessons, based on information, specific acts, corrective exercises, projects, stories, poems and games. Outlines for lessons throughout the year are provided for every grade below the high school. The book brings together under one cover the finest collection of health stories and health quotations that has ever been compiled in the English language.

The handbook is worked out on the principle that the sole object of health training in schools is to affect the habits of pupils so that they will adopt a healthful regimen of daily living. No importance is attached in the book to the memorization of definitions relating to the organs of the body or their functions. On the contrary, teachers are shown how to tell stories to their pupils and what stories will take hold of the imagination of the pupils and influence their actions in respect to health habits in nutrition, cleanliness, posture, clothing, care of the teeth, fresh air, avoidance of colds and so on. The entire handbook is dynamic. It is based on the present-day conception of the way in which children learn most readily and effectively, so that what they learn will exert an influence upon their conduct. The handbook is designed as an aid to teachers to supplement whatever text-books their pupils may study. In the hands of a resourceful teacher, it will extend and enrich any course in hygiene or health training.

SPUTUM CUPS

Sputum cups are sold by the North Carolina Sanatorium and delivered by parcel post anywhere in the State at the following prices:

Pocket cups65c per 100
Bedside cups65c per 100
Holders for bedside cups.....25c each

One of the most important things in the fight against tuberculosis is the

destruction of the tubercle bacillus. Two necessary methods of accomplishing this destruction are: (1) the shielding of the mouth and nose with gauze or paper handkerchief when you cough or sneeze, then burning the handkerchief, and the use of a proper sputum cup to hold the sputum, destroying the cup by burning; (2) curing the patient so that he won't have any germs.

HEALTH EXAMINATIONS

The keystone of personal hygiene is the periodic health examination. Any person who wants to learn how to live right should begin by having a human appraisal. Such an examination may show that the individual is in excellent health, which is a rather comfortable thing to know, or it may reveal physical impairments or faulty habits of hygiene. These defects and practices can thereupon usually be remedied and life made more pleasant, profitable and productive.

Recognizing the great importance of health examinations to every branch of public health work, the National Health Council has inaugurated a nation-wide campaign to induce ten million persons to go to their physicians for such beneficial human inventories during the year between July 4, 1923, and July 4, 1924. The slogan is, "Have a Health Examination on Your Birthday." The National Health Council is a confederation of the thirteen leading national voluntary health associations of the country, including the State health officers' conference, together with the United States Public Health Service as a consulting member. State health examination committees have been formed in practically every State to carry on this educational work. The organized medical profession has gone on record as favoring the movement, and the American Medical Association has prepared standard examination forms.

The National Health Council has also prepared educational material. This includes an eight-page pamphlet for distribution to the general public, a poster in two colors, a set of thirty lantern slides, a motion picture, and several reprints. This material, which

is especially suitable for use and distribution by health departments, women's clubs, medical societies, civic organizations, and similar groups, may be obtained from the council at cost price. The pamphlets sell for three cents apiece and the poster for ten cents. The lantern slides may be purchased for \$15 or rented for \$3 for each showing. A lecture outline and newspaper publicity is furnished with them. The motion picture entitled "Working for Dear Life" may be obtained without charge except payment of transportation costs. This film of about a reel and a half has been produced by the Metropolitan Life Insurance Company with the advice of the film committee of the National Health Council.

IN THE FARMER'S FAVOR

His Chances for Having Tuberculosis Not as Great as That of Other Occupations

Odds are not against the farmer in every case. For instance, his chances for having tuberculosis are fewest when compared with other industrial workers and wage-earning groups. In a list of forty-one classes of occupations, prepared by Louis I. Dublin, Ph.D., statistician of the Metropolitan Life Insurance Company, farmers and farmers' sons are shown at the top of the list as having the lowest death rate from tuberculosis. Railway engine drivers, stokers and cleaners are second on the list. Motor car and motor van drivers are third, builders are fourth, and agricultural laborers and brick and terra-cotta workers are fifth and sixth respectively.

Thus it is seen that the occupations affording a life in the fresh air have less susceptibility to tuberculosis than those of an indoor life. In other words, fresh air has a preventive value with regard to tuberculosis as well as a curative value.

At the bottom of the list is the occupation of tin miners, which has a death rate twelve times as great as that of farmers. Second from the bottom is cutlers, scissors and file makers, while barmen is third. Very high figures are shown for occupations exposed to

hard metallic and mineral dust, such as lead miners, scissors workers and cutlers. The next on list having the highest death rate are the occupations exposed to the use of alcohol.

ABRAMS TREATMENT EXPOSED

"Sly Creation Designed to Deceive," Says Report of American Chemical Association

A method of healing, commonly known as the Abrams' Treatment, which claimed an interest in all matters of a scientific nature, and which has recently been given much publicity, has been investigated by the American Chemical Society. Recently a member of the Indianapolis Section of the American Chemical Society invited a physician, who was using this method of treatment, to a meeting of the society to explain his system. The doctor appeared at the appointed time and gave an interesting talk on the results achieved by his instrument, known as the E. R. A. (electronic reactions of Abrams). Interest being manifested in the apparatus, he invited a committee of the American Chemical Society to his home to observe at first-hand the manner in which the machine was operated and the results obtained.

The invitation was accepted, and at the home of the physician, on the evening of March 28, 1923, many tests were made before the committee.

As to results, the committee's report says that the accomplishments attributed to the device are scientifically impossible, and characterizes the instrument as an "incongruous system." It says further:

"We have been reminded as we studied this machine and the methods employed of the fantastic creations produced by the minds of the inmates of our hospital for the insane. We believe the whole creation to be the product of an uninformed self-contained intellect or a sly creation designed to deceive for the purpose of gain.

"It must be distinctly understood that the activities of this organization in checking up pseudo scientific propositions are not directed towards the

suppressing of any real genuine information or discovery. We are open-minded and willing to be convinced of anything that is worth while, but our knowledge and training gives us a substantial basis on which to work in differentiating between the genuine and the false, and to a member we are absolutely opposed to the use of a

scientific nature in the way of facts or phenomena for the purpose of deceit and gain. In taking up this matter, we have dealt with it without prejudice and without favor, and have only a feeling of sympathy for those who have been deluded and deceived in this insidious and stupendous fraud of recent years."

MEDICAL HISTORY

(Each month, under the above heading, for the purpose of furnishing information to physicians as well as to the people generally, will be published something of the wonderful record of the history of medicine.)

TUBERCULOSIS

Notwithstanding the fact that the reduction in the prevalence of tuberculosis during the past ten years in North Carolina has been marked, the disease still ranks high as a cause of death. There is no magic cure for it, when a person is once thoroughly infected with it. There is no specific serum, vaccine, or other medicinal agent yet available to cure this terrible disease, although medical science has for generations sought incessantly for such a product. Like the road to learning, the road which a person with tuberculosis has to travel to recovery is not a royal road. If the disease is discovered early the road to recovery is there for those who will travel it. The trail has been blazed by Trudeau and others; and, in a word, leads through the land of simple, temperate living.

Pulmonary tuberculosis (consumption) "has probably been coeval with human existence, and very likely has afflicted our primordial ancestors." It is a world evil, and very little progress was made against the ravages of the disease until it was realized that medical science could not cope alone with it. It is a problem requiring the united efforts of physicians, economists, sociologists, legislators and humanitarians throughout the world, working in harmony, and working all the time.

It is a disease whose target has been more shining marks throughout the

history of the world than any other disease. It is practically agreed that infection generally takes place in childhood, those inheriting a predisposition being especially liable to attack. However the disease, if not active, remains latent, and usually strikes in the prime of life and usefulness, almost always following some disease like influenza or pneumonia, or a period of intemperate living. Thus the physician, lawyer, minister or business man is cut down at the period of maximum usefulness. The mother is stricken just when her children are most in need of her care. Homes are broken up and orphans left to the mercies of the world.

Throughout history, the literature and art of the world has suffered incalculable loss from this plague. Here in the South, Lanier and Timrod both fell victims. Among some of the most famous people in history who were victims of tuberculosis may be mentioned the following: John Paul Jones, Robert Louis Stevenson, John Keats, Chopin, Schiller, Laennec, Henry D. Thoreau, Artemus Ward, and so on and on.

As these lines are being penned, news reaches the editor of THE BULLETIN that "today the journey has ended" for a friend and former pupil—a dentist who had worked his way up against terrible odds into a good practice, only to succumb at last, leaving

a wife and six children to fight the battle alone.

In all the history of the world it is more than probable that it has been the one disease above all others against which physicians have had to battle in every country on earth. Twenty-five centuries ago, Hippocrates, the father of medicine, wrote: "The most dangerous disease, and the one that proved fatal to the greatest number, was consumption." After Hippocrates, Galen, Celsus and all other famous men of medical history down to the present have had to contend with this disease. Some of the Greek physicians recognized the infectious nature of tuberculosis. Naturally, they thought it poisoned the air and in that way transmitted the infection from a victim to others. A celebrated Greek lawyer in suing for the inheritance of an estate for his client, the son of a man dying from the disease, argued that his client should have all of his father's estate because he nursed him to his death, in face of the fact that "most of those who nurse in this disease themselves succumb to it." From what is known of the disease today it is easy to suppose that at that period of Greek history the disease was much more virulent than it is today. Also, knowing nothing of the cause of the disease and having no knowledge whatever of bacteriology, they had no idea how to protect the attendants from contracting it. An Arabian physician in the eleventh century had definite ideas about the infectious nature of tuberculosis and referred once to "many diseases which are taken from man to man, like phthisis." It is said that tubercles or nodules were first found in the lungs in the seventeenth century, and that about the middle of that century Silenius, an Italian, first demonstrated the connection between such tubercles and tuberculosis. Huber, in his great work on "Consumption and Civilization," published several years ago by Lippincott, says the sanitary magistrate of Florence, Italy, in 1754, asked for an "expert opinion from the Florentine Medical College as to what articles would be most likely to be infected from the presence of a phthisical patient. He was advised that patients who lived in large airy rooms

exposed to the rising or midday sun, especially during the winter months, do not require more than their rooms should be well cleaned and always purified by opening the windows as wide as possible." He was further advised that "the sick should only spit into vessels of glass or porcelain, which should be frequently and thoroughly cleansed." This advice, issued nearly two hundred years ago by a great medical college, and before the world had the least glimmer of bacteriology, should serve to convince the physician of today that much progress against the ravages of tuberculosis had been achieved before this generation. Also that final elimination of the disease from the earth will mean the culmination of centuries of study and persistent effort on the part of millions of people.

An obscure Scotch physician, whose name is not even known, is said to have urged on his colleagues about the middle of the eighteenth century that personal hygiene and diet are the most important essentials in effecting a cure, and that climate and medicine are but secondary considerations. About the same time a French physician observed with brutal frankness that "there are two kinds of consumption—that of the rich, which is sometimes, and that of the poor, which is never, cured."

It was reserved for Robert Koch, one of the founders of bacteriology in 1881, to discover the bacillus, which is the specific cause of tuberculosis. In a formal paper published by Koch in 1882 he announced to the world his discovery. Trudeau later said of this announcement: "His paper on 'The Etiology of Tuberculosis,' based on experimental research, at once threw a flood of light on the darkest page in the history of medicine, a light which revealed the microscopic fungus which is the direct cause of tuberculosis, gave a new impulse and opened a new horizon to medical thought." While Koch was more than twenty years younger than Pasteur, he and Pasteur were the founders of bacteriology. It is however probable that the world is more indebted to Pasteur for his great work in the realm of bacteriology. Prudden, the great pathologist, said of the last decade of the nineteenth century that

the great fundamental advance which signalized it was "the lifting of this whole class of fateful germ diseases out of the region of the intangible and mysterious, and their establishment, on the basis of positive experimental research, in the domain of the comprehensible and definite. The things which cause them are no longer for us mysterious emanations from the sick, or incorporate expressions of malign forces against which conjurations or prayers could alone promise protection. But they are particulate beings, never self-engendered, never evolved in the body, always entering from without—things which we can see and handle and kill."

In the conclusion of this article it may be stated:

First. Tuberculosis is one of the oldest known diseases.

Second. The first definite advance in combating it was achieved when Koch discovered the specific cause—the bacillus which bears his name.

Third. The second definite step in fighting the disease was also made by Koch in his discovery of tuberculin, which although mistakenly announced as a cure, in the language of Doctor Whittaker, of Cincinnati, did "establish the first real epoch in the treatment of tuberculosis, as it constituted the first real address to its cause."

Fourth. The last great step to the present is the rational, common-sense treatment which recognizes fully the methods of preventing its spread from sick to well, thereby preventing the patient from suffering cruel isolation, and at the same time protects the public from infection. The treatment is rational hygiene, instituted in its incipiency under expert supervision.

A STATISTICAL STUDY OF TUBERCULOSIS IN NORTH CAROLINA

By F. M. REGISTER, M. D.

(Read before Third Annual Tuberculosis Conference, Durham, October 31)

This paper will deal only in statistics, which is a very dry subject, but only by statistical study can we determine the extent and distribution of any particular disease. Every sandwich has to have dry bread to hold the succulent meat and every pie has to have a crust.

In North Carolina in 1922 there were 2,586 deaths from tuberculosis, all forms. Of these, 1,421 were female, 1,165 male. Of the females, 668 were white, 748 colored, 5 Indians. Of the males, 572 were white, 588 colored, and 5 Indians. Therefore, there were 1,240 white and 1,336 colored and 10 Indians who died from tuberculosis. Two hundred and fifty-six more females dying than males makes the situation serious as females have charge of the domestic end of the household, and therefore others of the family are more apt to contract the disease than if those cases when incipient were away from the home more.

We have a population of 1,856,723 white, therefore the tuberculosis death rate per hundred thousand for whites is 66.7. The population of 793,239 colored, gives a tuberculosis death rate of 169.6 per hundred thousand for colored.

For the first twenty years of life there were only 259 deaths; for the period from 20 to 40 years there were 1,484 deaths. In the next twenty-year period, from 40 to 60, there were 513 deaths. This shows that tuberculosis has an especial attraction for young people. Over one-half of all the deaths occurred during the productive period or in the twenty years between 20 and 40.

Looking at the deaths from tuberculosis classified as to occupation, we find the significant fact that among the deaths of females there were 1,177 for which no occupation was stated on the death certificate. We know that the majority of these were helpers in household affairs, therefore the oc-

cupation was not classified as only those are classified who are employed for salary or wages, so you see the problem of tuberculosis goes right back to the individual home. Of the male deaths there were only 195 in which no occupation was given. This clearly shows that the vast majority of males dying of tuberculosis are wage-earners or producers.

This large army of our young people march out into the Great Beyond year after year. Two thousand five hundred and eighty-six deaths scattered over a period of 365 days would mean only seven deaths a day scattered over 100 counties, so we take little notice. But if tuberculosis were a spectacular disease like influenza or diphtheria, and the 2,586 deaths occurred in about a week, which would mean 25 deaths to a county, and we knew that these deaths would occur year after year, every piece of the machinery of our Government would be put in motion to stay the hand of the destroyer, although for economic reasons it is better to die quickly than to linger long and finally die.

In 1922 there were more deaths from tuberculosis than from typhoid fever, malaria, measles, smallpox, scarlet fever, whooping cough, poliomyelitis,

meningitis, pellagra, burns, railroad accidents, automobile accidents and homicides combined.

But we have saved the best part of the story for the last. In 1914, the first year of our Vital Statistics Law, the white death rate from tuberculosis was 101.5, the colored rate 221.0 per hundred thousand population, a combined rate of 139.3 for white and colored, but our statistics were far from complete in 1914. In 1915 our law was working better and we had 3,710 deaths reported from tuberculosis, a rate of 156.4. Since 1915 our reports are better from year to year, still the tuberculosis death rate has gradually dropped until in the year of 1922 our rate for white and colored combined was 97.5. This gradual drop is due in great measure to the Bureau of Tuberculosis working under the State Board of Health, and the vast amount of educational work done by the womans' clubs, newspapers, Bulletin of the State Board of Health, and public health nurses. But we are not going fast enough. Two thousand five hundred and eighty-six deaths are far too many from any disease, especially from one that is curable and preventable.

ONLY ABOUT 50 PER CENT OF PEOPLE INFECTED WITH TUBERCLE BACILLUS; 90 PER CENT AS WAS FORMERLY CLAIMED TOO HIGH

By DR. L. B. McBRAYER, SANATORIUM, N. C.

In the Tuberculosis Number of the Bulletin of the State Board of Health, Vol. XXXV, No. 11, November, 1920, and in the American Review of Tuberculosis, Vol. IV, No. 12, February, 1921, we published results of our studies of this subject and reported work done by the Sanatorium staff in several different communities in North Carolina. Our conclusions were as follows:

1. House infection, that is, the house being the medium of transmitting the infection of tuberculosis from one person to another, is not probable.

2. The infection of tuberculosis is not transmitted by casual exposure, but requires prolonged exposure and massive doses of the tubercle bacillus to produce serious infection.

3. That 100 per cent infection with the tubercle bacillus is a myth, and that the probabilities are that the infection in the South, and particularly in North Carolina, is not likely more than 50 per cent and very probably much lower.

The United States Public Health Service made similar studies in Wisconsin with more or less similar re-

sults. They found 90 per cent of the people who lived in a house with an open case of tuberculosis infected, 50 per cent of the near neighbors, and 25 per cent of those living more remotely.

Notwithstanding the above-mentioned observations, and others, the large majority of the speakers and writers have gone on harking back to autopsy work in Paris, Berlin, and a few other large cities, many years ago. Now comes Dr. Linsky R. Williams, managing director of the National Tuberculosis Association, New York City, in his annual report to the nineteenth annual session of the association at Santa Barbara, California, May 1, 1923, and says:

"It has been assumed that from 75 to 90 per cent of all children of fifteen years of age were already infected with the tubercle bacillus. Recent evidence has been offered by Dr. Charles Hendee Smith, of New York City, who has examined 3,500 children and performed the tuberculin test both by the Pirquet method and the intradermal method, and has found that less than 40 per cent of the children reacted at the age of fifteen, and these were children in attendance at the Bellevue Hospital Dispensary, who come largely from the indigent class in a great metropolitan city. There is no doubt that this group of children represents a district more highly infected than one would find throughout the country as a whole.

"This is in marked contrast to the 90 per cent of children of fifteen years of age reacting in Vienna and 75 per cent in Geneva and Paris. This is a definite indication that there is less infectious material in New York City than in continental cities. Results

very similar have been reported from St. Louis and Philadelphia, 48 per cent and 35 per cent respectively.

"It is believed that the remarkable fall in the death rate has been due primarily to the anti-tuberculosis campaign, and no one can estimate the proportionate amount due to the measures taken to destroy the tubercle bacilli the moment they leave the human body, and to those other measures recommended and adopted which have improved the health of the individual.

"The executive office is convinced that the present campaign and the activities of the various associations are based on sound scientific grounds, and that the results speak for themselves."

You will note that Dr. Williams states that this greatly lowered rate of infection is due to the destruction of the tubercle bacillus at its source; that is to say, while in the human body, by curing the disease, and, as it leaves the body in the sputum, by using proper sputum cups and burning the sputum, and by shielding the mouth and nose when coughing or sneezing with gauze handkerchief or paper napkin, the same being destroyed by burning.

Referring again to the subject of this article, let us say that when so many different doctors in so many different sections of the United States, conduct studies of this kind and arrive at similar conclusions it should be considered conclusive evidence until the findings are changed by further studies, which should be continued at intervals of a few years, and the speakers and writers should take note of same.

"Every person who has tuberculosis has a right to know it, to be properly treated for it, and to be so supervised that he will not communicate the disease to others." —McBrayer.

HOW A LOCAL TUBERCULOSIS PROGRAM SPENT \$5000 CHRISTMAS SEAL MONEY

By R. L. CARLTON, M. D., WINSTON-SALEM

Winston-Salem had the distinction last year of having made the largest per capita contribution to the Tuberculosis Christmas Seal sale of any city of 50,000 inhabitants in the United States. The amount of the sale was \$7,000. When the expenses for conducting the sale and the percentages due to the State and National Tuberculosis Associations were paid, there was left to be spent on the local tuberculosis program more than \$5,000. How this amount has been spent during the year to combat tuberculosis in Winston-Salem is given in the following report. This in brief is that part of the Winston-Salem Tuberculosis Program that is supported by Christmas Seals. The various expenditures must be right heartily approved by our people because they were told before the seal sale how their money would be spent, and their subscriptions amounted to \$500 more than the budget mentioned. We will be happy if we can duplicate our experience last year in 1923.

Expenditures

Cost of seal sale.....	\$ 350.00
Educational materials	375.00
Milk for children.....	400.00
Material relief	375.00
Sputum cups and supplies.....	125.00
Modern Health Crusade supplies	75.00
Nurse—Modern Health Crusade leader	1,500.00
Nurse—Tuberculosis	1,200.00
Transportation—one car	450.00
Wayside workers — visiting nurse and car.....	400.00
 Total expenditure	 \$5,250.00

Educational Materials \$375.00

Included under this item are the publication and distribution of a number of health leaflets, many of which were prepared especially in the interest of the local situation; the printing

and mailing of letters to parents of every child reported as having measles or diphtheria during the year—the letter pointing out the dangers of tuberculosis following such diseases if the best after-care is not observed, and the issuing of newspaper articles at frequent intervals.

One other item of some expense was payment of part of the cost of a local worker's attendance at State and National Tuberculosis meeting. This seems to be a well-justified expenditure in that the worker receives and brings home new enthusiasm, new ideas for methods and equipment, and profits by the experiences and results achieved by other workers and organizations.

Milk for Children \$400.00

We have 2,000 under-weight school children enrolled in special nutrition classes. These children are 10 per cent or more below the weight they should be for height and age, and are finding it difficult to keep pace with their classes and more robust mates, and all too easy to become victims of disease. An expert nutrition worker teaches these children what and how they should eat and why, and the \$400 item mentioned in our list of expenditures has paid for milk which is given free of charge to those children not able to buy it. In this nutrition program we are under obligations to the Red Cross organization which has for the past two years supplied us with a full-time nutrition worker. Co-operating in the supplying of milk are funds furnished by the city of Winston-Salem, Parent-Teacher Associations, Red Cross and the Sentinel's Free Milk and Ice Fund.

Material Relief \$375.00

Food, clothing, board bills, rent, expense of sending patients to sanatoria, expense of sending boys to school, shoes especially fitted, brace, cots, cure

chairs, curtains, sleeping porch are among the items provided by this fund that some of our sick neighbors may have nourishing food, rest, sunshine, fresh air—be cured.

In this matter of material relief, the co-operation of the Associated Charities and its nurse and welfare workers and that of county and city welfare departments have always been assured for the tuberculosis program.

Wayside Workers \$400.00

The Wayside Workers is an organization of women doing welfare work of very high character, the organization having grown out of a Sunday school class in which these same women once worked. The \$400 turned over to them was in turn spent for nursing care, material relief of sickness, and poverty and distress.

Sputum Cups and Supplies \$125.00

This means just what it implies: cups, bedside and pocket, gauze, handkerchiefs and other supplies needed by tuberculous patients.

Modern Health Crusade \$1,500.00

In the schools of our city there are 3,000 children enrolled in Modern Health Crusade classes. For the past three years one school nurse has been made responsible for the organization, maintenance and leadership of these groups. She is known as our "Modern Health Crusade Executive," and her work is made possible by funds supplied by Christmas Seals. Supplies for this work amounting to about \$100

are also bought by this fund, others by city appropriation. This work is endorsed by superintendents and principals of our schools, and teachers and school nurses assist in carrying on the interest in the various chores.

Nursing Service \$1,200.00

There is no argument needed to convince any one who has studied tuberculosis problems that nurses who know the tuberculosis game are the outstanding high peaks in the fight against this disease. Our program calls for two full-time nurses for tuberculosis work only. One of these is paid by city appropriation, one by Christmas Seals and Health Bonds. The \$1,200 mentioned in our expenditures for nurse covers a little more than ten months service—there being a vacancy of one worker for a short time. For the use of this nurse \$450 was used to provide a car for transportation. The transportation item and salaries of two nurses—one tuberculosis only, one Crusade leader, total \$3,100, which is decidedly the greatest expenditure of our Christmas Seal fund—is fully justified by the importance of the nursing activities.

No tuberculosis program can be complete or hope to do very effective work without an efficient staff of nurses who understand how to work with doctor and clinic in the examining and discovery of patients who are tuberculous, and then who can follow them into their homes and while teaching them how to not be a menace to others, can point them to the door of hope—recovery.

STATE SOCIETY ENDORSES CLINICS

At the meeting in Asheville, April 17-19, 1923, of the Medical Society of the State of North Carolina, Dr. W. H. Smith, of Goldsboro, in the House of Delegates, offered the following resolution, which was unanimously adopted:

"Whereas the medical profession of North Carolina welcome more knowledge on tuberculosis; therefore, be it

"Resolved, That the House of Delegates recommend that the clinician holding the tuberculosis clinics for the North Carolina Tuberculosis Association be requested to hold teaching clinics for physicians at each point where diagnostic clinics are held."

THE NUTRITION CLINIC

By D. R. PERRY, M.D.,

Director of Tuberculosis Clinics, North Carolina Tuberculosis Association,
Sanatorium, N. C.

(Read before the North Carolina Conference on Tuberculosis, Durham,
October 31st, 1923.)

The child who is under-nourished or handicapped by physical defects cannot compete with the normal child, either physically or mentally. Nor can he whose brain is under-nourished be expected, as he matures, to develop strength of character. Then we would all agree, that in justice to the child, he must be put in condition to resist disease and to take his place, ultimately, in the community on an equal footing with others. The health of the growing child is looked after by the home, theoretically, but actually the health tests in the school show in how small a percentage of cases this is successfully accomplished. To accomplish the best results the health, school, and other welfare workers will co-operate, as experts, with the home. Then we will have the ideal community.

Under-nourishment does not tend to correct itself, and it is no longer considered to be an outcome of poverty or bad environment. It may be found among the well-to-do as well as the poor. There are convincing indications that the fundamental sources of malnutrition are more often concerned with the status of the individual than with group conditions, social, or racial factors, and the preventive or corrective measures must be centered on the individual rather than on the group from which he comes.

Dr. George Newman, the chief medical health officer of England says:

"Malnutrition is one of the greatest evils of the child's physique. The malnourished child tends to become disabled and unemployable, incapable of resisting disease or withstanding its onset and progress."

The basis for nutrition work is that every child requires a certain body weight to sustain his height. To

identify the malnourished children, one has only to secure the age, weight, and height and then refer to the standard weights for height and age which are printed in the Modern Health Crusade and the Nutrition Crusade literature of the National Tuberculosis Association. Those children found to be 7 per cent or more under-weight for their height will represent the under-nourished children in the group. There may be a small percentage that will have to be determined by individual diagnosis. After the under-weight children are identified, the nutrition class is organized, and at this point the real work begins.

When the first class meeting is called the mothers, fathers, and teachers of the children concerned are invited and requested to be present. At no time should a single class have in it more than twenty children. At this time the signs of under-nourishment are demonstrated. No charts or lantern slides are needed, for right in the class you have the living subject.

The physical signs most common are: paleness, mouth-breathing, flabby muscles, round shoulders with stooping posture, curvature of spine, and prominent abdomen. The nervous condition should always be pointed out, such as restlessness, the timid and contrary child, and the inattentive and forgetful youngster, who when corrected shows his temper. Then go to the cause and what malnutrition will mean to the future of the child if not corrected during the growing period. Dr. Emerson lists the causes in this order:

(1) Physical signs, such as are previously mentioned.

(2) Lack of home control. Here the parents are shocked when they see that their work is so important in the

correction, and they are asked to remedy the next three causes.

(3) Over-fatigue, too much work before and after school, late hours to perform too heavy school and social programs. In most cases the newspaper business, bicycle riding and tennis will have to be cut out, along with the work at the grocery store, etc.

(4) Faulty food habits. This is caused in most cases by parents giving their children too much money. The day is begun with no or insufficient breakfast—the peanut, candy and popcorn men are all benefited, but the child suffers. Too long between meals, and then not enough; in many cases improper feeding—tea and coffee, with large amounts of pork being allowed, a large piece of country ham for supper with black molasses and gravy, and the night is spent dreaming about snakes and other frightful things; and the next day the child is in a state of nervousness caused by insufficient sleep and rest. Irregular and too-fast eating must always be corrected.

(5) Faulty health habits, lack of fresh air and, in some cases, not enough exercise. Here the attention is called to the use of soap and water—always include the toothbrush and washwoman.

There is no doubt about the amount of interest that is created among the parents, and they begin to look for the signs of under-nourishment. Here the medical work comes in, and each child is given a thorough physical examination; also a social and mental examination, if necessary. The object, of course, is to determine the cause of the child's abnormal condition. When the causes are known and removed, the child is "free to gain."

He is now ready to be enrolled in the Nutrition Crusade, which is well outlined by the National and State Tuberculosis Associations. The class is better conducted by a nutrition

worker who has had training and experience, but may be conducted by a teacher. A physician should co-operate in the work, and without his aid the fullest success will not be obtained. The program for the work is adapted to each individual child.

Home co-operation is the keystone of all public health work, and this includes Modern Health and Nutrition Crusaders. The aim is to make every child well in his own home, and to get into the home the instruction that is given. One of the most important things that is noticed is that the parents of the children who are graduated from the class, which takes usually from eight to fifteen weeks, will continue to watch the weight and development of their children through the remainder of the growing period.

Never dismiss a child from a class and put a limit to his growth by saying, "he is just like his father," or "he was always tall and slim." The aim should be to give every child every chance to come up to average weight for height during the growing period. When once a child is able to make the best growth that is in him, it is encouraging to know that he tends to maintain his gains monthly and develop normally, because nutritional balance has been secured, physical defects and ills have been removed and good food and health habits have been established.

Dr. Emerson says: "The younger the child the less his resistance to tuberculosis. In order to save the child we have either to prevent infection or increase his resistance. The work of the tuberculosis associations has been directed chiefly to preventing infection. In addition, this work should be directed toward building up his resistance, and this means to build up his nutrition. Therefore the problem of tuberculosis is essentially the problem of nutrition."

BUY TUBERCULOSIS CHRISTMAS SEALS

HOW GUILFORD COUNTY GOT HER TUBERCULOSIS SANATORIUM

By MRS. ANNETTE SLOAN TINSLEY

Member Board of Directors, Guilford County Sanatorium, and North Carolina Tuberculosis Association

(Read before Third Annual Tuberculosis Conference at Durham, October 31st, 1923.)

Guilford County's Tuberculosis Hospital is now nearing completion, and we are justly proud of it, for it represents years of long and patient building. Its real cornerstone was laid in 1915, when a small volunteer charity organization was presented with a check for \$45 realized from the sale of seals. With this paltry sum to our credit in the bank, and with the charge of a young girl destitute and in need of treatment at Sanatorium, began the first active tuberculosis work in Greensboro. We didn't save that girl—she had gone too far—but it was the beginning of our relief work, which gradually developed into tuberculosis relief work almost exclusively, as we realized the need and the opportunity.

This work we financed by appeals to business men, to fraternal organizations, and our colleges and churches. We offered the public each year a statement of our budget showing how these funds were expended, and we won the confidence and financial assistance of practically every business concern of the city. Then with each succeeding December, and its Christmas Seals, we aimed at a higher goal and reached it. Back of our work, and always ready with progressive ideas and advice, stood Dr. McBrayer, urging us on to greater effort.

In 1920 we used part of our seal money to purchase a cottage sanatorium, borrowing from the bank the amount necessary to complete the purchase price. In two years time we had paid off the entire indebtedness in addition to operating our tuberculosis home. This modest little institution proved a God-send until we were able to build our present county hospital.

In the three years of operation we have salvaged fifteen cases, who have been restored to working power. It has proved conclusively that it pays to start the fight on a small scale while working and striving for the larger project.

December 20, 1921, the election was called for our \$100,000 bond issue for a county sanatorium. The success, or failure, of a bond issue is determined before, not on election day, therefore look well to your plans. The preliminary campaign, if well planned and executed, will assure your success. Study your registration books with holy diligence, and see to it that every qualified voter registers, then any opponents may be converted before the election. Don't spare your advertising. A sympathetic and enthusiastic local press is certainly one of the strongest factors in the fight, but you can't expect them to give more than frequent and strong editorials as their contribution, yet you can't stop there. Advertise with such force and appeal that nobody shall fail to read and discuss the issue—full-page advertisements, I mean. This costs money, of course, but it pays to advertise your cause, and perhaps some generous-hearted citizen will take care of this necessary expense, which was Guilford's experience. Secure pledges of support from all civic and fraternal orders, your churches and women's organizations, cash in every phase of your community life.

Full credit is due the women of Guilford for their splendid work. They rallied a wonderful force at the polls, and it was largely due to their zeal that we showed a majority of fifteen hundred votes. In this election we had

the support and sympathy of our board of county commissioners, whose influence meant much. We also had the years of service of our faithful and efficient district nurse, familiarly known as "Mother Peck," and the "Good Samaritan of Elm Street," with results to show that the volunteer work in Guilford had been worth while and merited a co-operative county fight.

With the hospital assured, it then developed upon the volunteer workers in the fight to keep up a keen interest throughout the county, and create a feeling of pride in, and responsibility for, the success of the institution. Now that the doors are almost ready to be opened, we are preparing to wage a mighty warfare.

We are very fortunate indeed in having secured for our superintendent Dr. J. L. Spruill, with his experience and reputation in State clinical work. For the past two months he has been on the ground making an exhaustive survey of the county, and formulating definite plans of operation. Clinics have already been held in Greensboro and High Point, and will be extended throughout the entire county.

The Medical Society has passed a resolution whereby every case of tuberculosis coming under their observation shall be reported to the county hospital. The health departments of both Greensboro and High Point have pledged their hearty co-operation to the same end. This makes the institution a clearing house for all tuberculosis work under the general supervision of Dr. Spruill. In the field work, Greensboro will maintain a whole-time tuberculosis nurse; in High Point the city nurse will stress the tuberculosis branch of her work for the coming year, and in the county at large another tuberculosis nurse will be employed.

Christmas Seals this year will be sold with a greater zest to aid in the National and State work, and for the local purpose of financing the relief, nutrition and other branches of field work not taken care of by our maintenance tax.

With the county's health organizations, community clubs and every available health force pressed into service, we are organizing for a dead-earnest fight against tuberculosis. Our weapon is the two-edged sword—Prevention and Cure.

GUILFORD COUNTY TUBERCULOSIS SANATORIUM

By DR. J. L. SPRUILL, SUPERINTENDENT

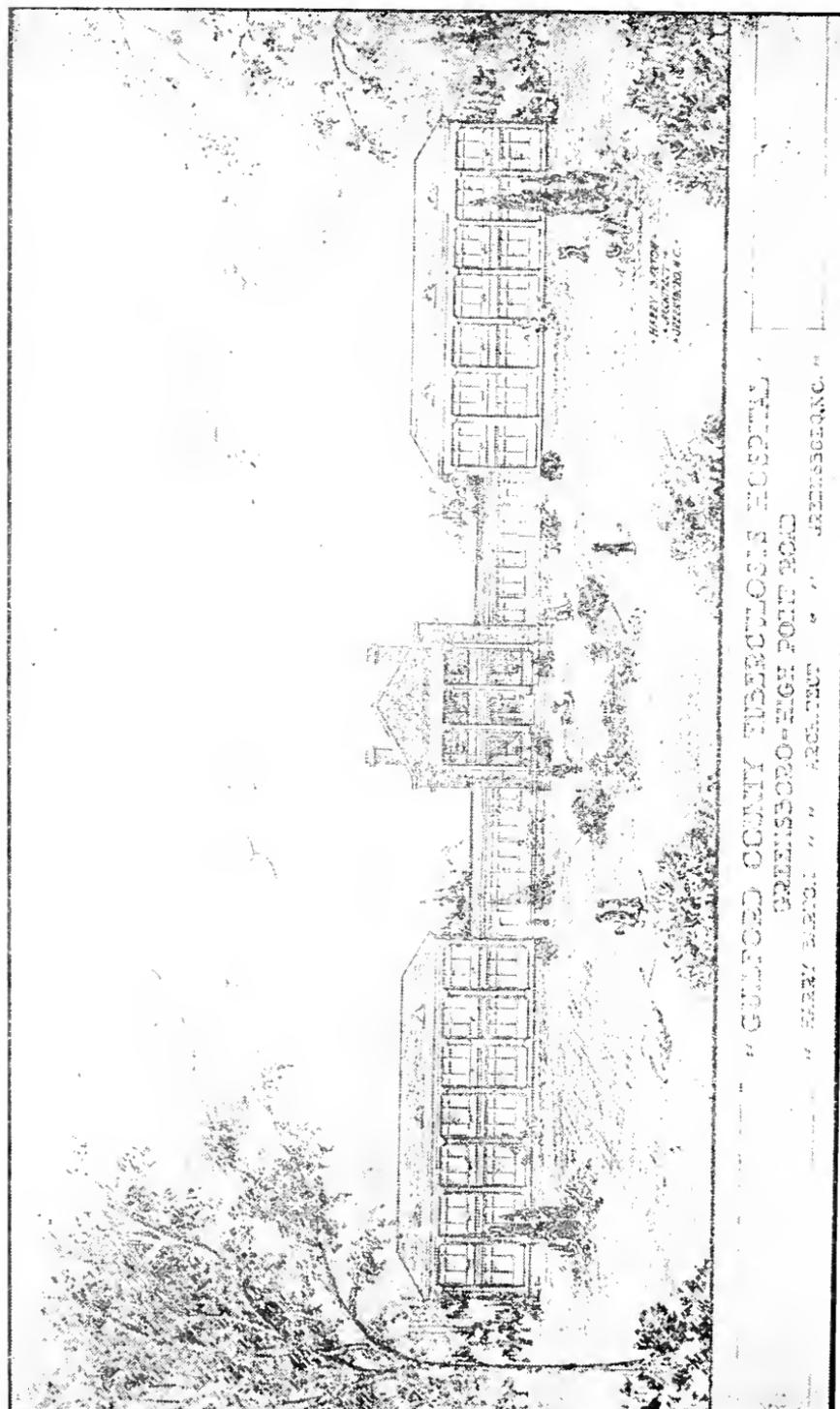
The Guilford County Tuberculosis Sanatorium is the first institution built under the act of 1917, which authorized any county to build and maintain a tuberculosis hospital by bond issue and special tax.

It is a beautiful structure located on a hill overlooking highway number ten, ten miles from Greensboro and five from High Point, and is at present about completed, and will be formally opened January 1, 1924.

Its total cash value when finished and furnished will be about \$165,000, and will accommodate sixty patients without crowding. The building consists of a central or administration

building and two wings of two stories each, with a basement under the central.

The central building contains the main waiting room, business office, physicians' examination rooms, X-ray rooms, central charting and filing room, patients' living room, dining room (white and colored), kitchen, and staff dining room, all on the first floor. The second floor contains the physician's private apartment and the nurses' quarters. The basement is occupied by the boiler room, ice plant, sterilizing room, laundry and a number of store rooms. The drug room and laboratory are also located in the basement.



The wings are connected with the main building by glass-enclosed corridors, and are equipped to care for twelve patients on each floor. The beds are placed on twelve-foot screen-enclosed porches, opening upon which are steam-heated dressing rooms, bath-rooms and toilets.

Back of the administration building, connected thereto by another glass-enclosed corridor is the colored department, which is constructed on the same plan as the white, and accommodates twelve patients.

The accompanying cut shows the general appearance of the building fairly well.

While this institution was built by a bond issue, and is maintained by special tax, it is not an exclusively charitable institution; and while no citizen of Guilford County will be refused admission because of inability to pay, still every patient whose financial condition is such that he can pay a reasonable sum for his care and treatment will be expected to do so.

Patients outside of the county will be admitted when there are vacant beds but will be required to pay a certain amount, not yet settled upon.

The object of this institution is to have a place where the tuberculous patients of Guilford County can go to be cured, and not a place where people go to die. Consequently, no incurable or far-advanced patient will be admitted except under extenuating circumstances.

The superintendent has full charge of the tuberculosis conditions in Guilford County, in connection with the county and city boards of health and the medical profession. Tuberculosis clinics are now being organized and held at regular stated intervals in the cities of Greensboro and High Point, and at other designated points in the county, and lectures are being given by the superintendent at every point possible and as frequently as his other duties will permit. The object of this work is to find the early cases and get

them in the hospital, as well as to educate the people along the line of the disease.

As soon as the work is organized it is the purpose of the board of directors to put on one or more tuberculosis nurses in the county to assist the superintendent in locating the early cases and to help care for the incurable in their homes, when the attending physicians desire assistance.

The hospital is completely equipped with an X-ray machine for diagnosis, and all necessary laboratory equipment, with X-ray and laboratory technicians.

Free diagnostic clinics will be held at the hospital every morning from ten to one, by appointment, for patients in the county, but no free examinations will be given to any patients coming from elsewhere. For these, a charge of five dollars for physical examination and ten dollars for X-ray will be made. Patients coming from the county without having made appointment will be charged the same fees, but all such fees, or any other fee, no matter how obtained, will be paid directly into the treasury of the institution and not to the physician making the examination, his regular salary being his only compensation.

ECHOES FROM DURHAM

Mrs. J. M. Gudger, Jr., of Asheville, made a strong plea for the organization and utilization of the whole county, all the people, in the fight against tuberculosis, and particularly in the sale of the Tuberculosis Christmas Seals. She also spoke of the county nurse, made possible by last year's seal sale, and the splendid work she had done.

* * *

A large number of the rural supervisors of colored schools were present, and two very interesting papers were presented by Dr. J. W. Walker, of Sanatorium, and Mrs. M. A. C. Holliday, of Statesville.

BUY TUBERCULOSIS CHRISTMAS SEALS

VALUE OF X-RAY IN DIAGNOSIS OF TUBERCULOSIS

By THOMPSON FRAZER, M. D.,
Of Asheville, with Discussion by P. P. McCain, of Sanatorium

(At Third Annual Tuberculosis Conference, Durham, October 31st.)

I think the question often comes up among doctors as well as among laymen as to what is the value of the X-ray in tuberculosis. Sometimes there are doctors who think it is not of much use, yet on the other hand there are those who think with the X-ray we ought to be able to detect tuberculosis in any degree or in any stage. The point I want to bring out is that the X-ray is very valuable, but it is only another means at our command of learning more about the patient. As you know, the X-ray records differences in densities. That is to say, if you have a very dense object the X-ray gives an opaque shadow. It will never supplant the other means which we have of making a diagnosis of tuberculosis, and by that I mean the taking of the history, for instance, which shows so often symptoms suggestive of tuberculosis, loss of weight, cough, expectoration, spitting of blood, etc. The history, then, is something we cannot do without. Then we have the special means of examination, that we call physical examination of the chest, and of the sounds in the lungs so far as we are able to determine them by the ordinary means of procedure. Then we have the examination of the sputum, which is positive and final evidence if we get a sputum which contains bacilli. So the X-ray is only another means at our disposal for increasing our knowledge of the person with tuberculosis. It does not always bear out exactly what we find by other means; commonly it shows more than we are able to discover by other means. Another thing it does is to uncover other things which we might not have discovered. Another thing is that it gives us a record, a definite, graphic, permanent record which can be compared with other pictures taken from time to time.

Dr. P. P. McCain, Sanatorium, in discussion, said: I want to express my

appreciation of this paper and to commend Dr. Frazer not only for giving us such a talk but for presenting it in such a way that not only physicians but laymen can understand it.

The X-ray has reached the stage now where it can hold its own remarkably well with the physical diagnostician. Before the time of the X-ray, when we had nothing to check us up, we chest men, I think, developed a considerable degree of egotism and felt that we could tell if any one had tuberculosis, just how much any person had, and whether there was a cavity ranging from the size of a cherry on up. But I think before the days of the X-ray we called a good many things tuberculosis that were not tuberculosis and let slide by some cases that probably had deep-seated trouble but did not give physical signs.

At the Sanatorium, now for about five years, we have been checking up our physical findings with stereoscopic X-ray of every patient admitted. It opens our eyes every once in a while. For a while the same man made the physical examination and the X-ray, but now we have, we think, a better plan. They are made by different men, the findings written up independently, and once a week we meet for conference and compare the physical findings with the X-ray. We are having more and more respect for the X-ray findings all along.

There is one danger which we should keep in mind. The public believes the X-ray is absolute. If the X-ray seems to show tuberculosis, even if the picture is made by a man who has just bought an X-ray and put it in and it is his first picture, the public would believe it notwithstanding whether Dr. Minor or Dr. Dunn or some other equally capable chest man said otherwise. It takes an expert man to read an X-ray plate, and the public is just beginning to appreciate that.

THE MODERN HEALTH CRUSADE, NUTRITION CLASSES AND SEAL SALE AMONG NEGROES OF IREDELL COUNTY

By MRS. M. A. C. HOLLIDAY,
Rural Supervisor of Colored Schools, Statesville

(Read at the Third Annual Conference of North Carolina Tuberculosis Conference, Durham, October 31.)

Eight years ago I began my work as supervisor in the negro schools of Iredell County. Having served as supervisor of Columbus County for four years, I did not find myself a stranger to the rural conditions. However, I was in a new field, hence new duties.

After conferring with the superintendent, Mr. R. M. Gray, I was encouraged to begin my work, for I found that he was thoroughly interested in education for all races in the county. With the hearty co-operation of him and the Board of Education, I felt that I should succeed, for success of the supervisor depends largely on the attitude of the superintendent and school officials.

Knowing that organization is one of the best methods in launching any good movement, I called together the teachers, then the patrons, and organized a "Teachers Meeting and Community League." With everybody lined up, my program started. These meetings are held monthly to discuss various problems and to give demonstrations that will benefit the school and community.

As physical defects impede all lines of work, we have endeavored to put before our organizations a standard of good health. Through the interest and influence of the superintendent, Mr. J. A. Steele, the Board of Education bought and paid for the Modern Health Crusade material and gave it to our schools.

We have in our schools 1,526 children, and of this number 1,000 are Crusaders. The children delight in their organization and exhibit its benefit by coming to school cared for in such a manner that one readily sees

that their health chores outlined on the Crusaders' cards are being observed.

Once in a while some member will fail, but he is made to feel very unhappy by other Crusaders calling attention to health chores left undone.

In the thirty-three schools of our county, 1,000 children have individual drinking cups and toothbrushes. Some of the teachers have put forth special efforts to have the cups handled in a most sanitary way.

It was interesting to watch two little girls chosen as captains in one of the schools handle the cups. The cups had been sterilized by the captains. When time came for dismissal these girls arose. One carried a clean flour sack of cups, the other a pail of water. All marched out in order and stood in a long line. The captains passed the cups and poured the water.

At one of our Rosenwald schools the Crusaders, with the help of their teachers, built sanitary wall cases in each room for their cups. They gave an entertainment and raised money to buy a tin cup for each child and two small tin tubs for sterilizing them. The wall cases had large black numbers on the shelves. Each child had a number and placed his cup over it. In this school the Crusaders purchased for recreation a basket-ball, volleyball, croquet set and a play-ball and baseball outfit. The principal and large boys built swings for the primary grades. A piano was bought and music and games were enjoyed indoors on rainy days. The Crusaders made beautiful health posters and a First Aid Case, which they equipped.

One passing this school is attracted by its clean premises, artistic arrange-

ment of flowers and shrubs, flag-pole with the stars and stripes waving high, and tidy children playing various games under the supervision of teachers.

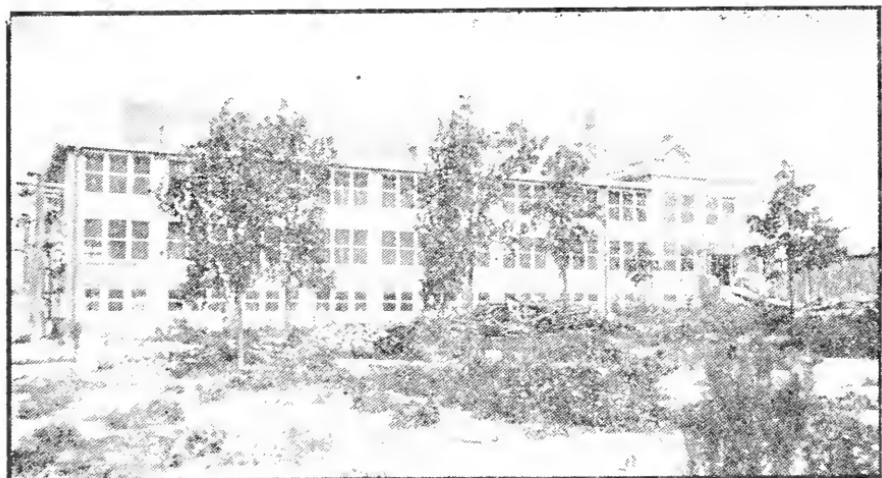
Many Crusaders delight in doing their chores with the hope of getting a health button. Often a child is seen at church, at school and abroad with as many as four buttons on. The grown-ups like buttons, too, and they are found obeying the laws of health with the hope of receiving a button.

Although some of the older folks still fear night air, the Crusaders' influence is being seen and felt in many homes. Fresh air, wholesome food and cleanliness are finding their places where Crusaders abide. Very little illness is found in schools where Crusaders have proper supervision.

In our community league much discussion is given to health. We have no nurse or physician for our schools, but our leagues have been very fortunate in receiving lectures on health from one of the colored physicians of Statesville. This physician has given his services freely for eight years. One cannot imagine the ailments saved from time to time as a result of the doctor's coming to a league meeting. Many express themselves as being restored to good health after following the advice given in the lectures. If the health work has proved to be of any worth in the county, I attribute it largely to this physician, for he has been patient and has sacrificed to help in this phase of education.

Last term, Miss Hobbs, State Nurse, made a physical examination of our

SANATORIUM FOR NEGROES



This building, in process of completion when the picture was taken, was opened October 10th for the treatment of negroes with tuberculosis. To date there are 14 patients, with a long waiting list on file. The capacity of the building is 64. It is similar in construction to the building now occupied by white patients and equipped with the most modern of sanatorium and hospital facilities. It is situated on a high sand knoll on the Aberdeen-Fayetteville highway about one mile from the State Sanatorium.

Dr. J. W. Walker, formerly of Asheville, who is one of the leaders of his race, will be the medical officer in charge. Mrs. C. E. Broadfoot, graduate of the Frederick Douglas Hospital of Philadelphia, is head nurse.

The negro division will at all times have the benefit of consultation with and direction of the Sanatorium staff. It will be conducted just as the white division is, with a charge of \$1.50 per day, payable monthly in advance. All laboratory and X-ray work will be done in the Sanatorium laboratory. It is the purpose of the board of directors of the Sanatorium to give the negro patients the benefit of all the scientific examinations and treatment that the white patients receive.

children and found many of them under-weight. With the co-operation of a few of the teachers, we started our nutrition work to remedy some of the causes found. We demonstrated balanced meals for a school child in several of the schools.

At our exhibit of school work in the spring, five of the schools had nutrition tables well prepared. The Crusaders had a display of posters pointing to good health. Thus you see just a beginning has been made in our nutrition classes.

Twelve group contests were held in the county last term. Health exhibits were displayed. Compositions on clean-up week were written by Crusaders. The judges of our exhibit represented members of both races, and they expressed themselves as finding their job a difficult one, for seemingly all were good.

Iredell County has a population of 37,956. Of this number 7,369 are negroes. According to statistics nearly one-third of the negro population from ten years and over is illiterate. In spite of this conditions we sold \$141.41 worth of seals in our campaign.

It is not an easy job to sell the seals. Some will quickly say that they cannot

use them on a letter. Some of the teachers, however, used rather unique methods in raising their allotted amounts.

One teacher gave an entertainment that included every child. The primary children made drawings of animals and colored them with crayons. These were tacked on the wall behind a sheet. This was called "The Side Show." Any one desiring to see the show must buy a seal. The upper grades had a "Tacky Party." Five seals had to be bought to see the party. They had a "Fortune-Telling Booth." A seal had to be bought to have a fortune told. Seals were placed on some of the refreshments and called tax. To buy the refreshments one must pay extra for the seal. This teacher's quota was ten dollars. She raised sixteen dollars by this project.

As one goes from community to community and school to school, seeing the need of health promotion and realizing the efforts being put forth by many agencies in the great movement for health, it is gratifying to know that there are found here and there a few men and women who have caught the spirit of the Master by going about doing good.

DISCIPLINE AN IMPORTANT PART OF THE TREATMENT OF TUBERCULOSIS—REST AND CO-OPERATION A NECESSITY

DR. W. L. DUNN, ASHEVILLE

A sanatorium without discipline is no sanatorium at all. I do not care whether it is a private sanatorium or a public institution. The discipline in a private sanatorium is usually much stricter than it is in public institutions, because the doctor with private patients can control his patients much better without interference from without than the man in a public institution. By discipline is meant the control of the patient's life. Government patients who have come under my charge have many times complained of the severity of the discipline as being much stricter than in government hospitals.

The whole problem of treating tuberculosis is one of treating the individual who happens to be the victim of tuberculosis. We have no means of treating tuberculosis except by treating the individual. Medicine, drugs and all that sort of thing play no great part in the treatment. A very important part, however, is the question of rest. If I may put it non-technically, one of the important things is to put the lung at rest. The lung, like every other organ, will heal when it is at rest. It is a matter of common experience that we will breathe more and deeper when we run than when we sit, and breathe faster when we sit than when we lie.

The type of rest needed is bed rest—a long, continued period of bed rest. This necessarily reduces the endurance of the patient, softens his muscles and makes him non-resistant to exertion, so that a thing that would not have hurt him at all before he went to bed may be positively injurious and dangerous after he has been in bed for two, three, four, or five weeks. It is unfortunately true that with one single indiscretion in physical exertion, the patient may upset all that he has gained in many weeks. It is, therefore, necessary that discipline be so strict that a patient will not indulge in these little indiscretions that come from time to time, as it is the single indiscretion that sometimes will defeat the purpose you have in view, or that will upset practically all you have gained. There-

fore, the discipline has to be so strong that the patient does not easily make the occasional slip.

To give you an illustration of how important I consider discipline in my own work, a patient who breaks bed rest is discharged. That is private work. He is discharged, and there is no come-back on that. He must get another doctor. We place all of our records, and every bit of information we have on his case, at the disposal of the new doctor, so that he has not lost anything by changing doctors, but can no longer be under our care. That is not for any other reason than of impressing the patient with the importance of sticking on the job, as I put it, twenty-five hours out of the twenty-four.

THE SANATORIUM AND THE HOME IN THE TREATMENT OF TUBERCULOSIS

By ALLEN K. KRAUSE, M. D.

(From November issue *Journal of the Outdoor Life*)

There is now no part of the United States that does not have its sanatoria. While most of them seek the benefits of climate and are placed in the country, there are some in large cities and their suburbs. Though the tendency is to place them in hill or mountain country, not a few are at sea level or even overlook the ocean.

They have grown up under auspices of every kind, designed to serve the ill from all walks of life. They have been built and maintained out of funds from public taxation, private bequest and contributions, fraternal organizations, religious sects and societies, charitable and business organizations, and private and corporate capital for profit. There are sanatoria which cost the patients nothing and which even assume the expenses of transportation; there are those supported entirely by the fees charged patients. Trudeau's idea was to found a refuge for the man and woman in between: for some of that large number of the tuberculous who, unable to bear the expense of months of necessary inactivity and

treatment, could yet contribute something toward it. He had particularly in mind the care and re-establishment of young men and women in business, trade and the professions, or of the young women who come from homes of modest means—those who, in health, carry much of the burden of economic production and are its hope for the future, but who, crippled early in life, before thrift has had time to put aside a competence, would in most instances succumb to the stern economic necessities of the case. He tried, therefore, to extend care for about half what it cost him per patient, and yearly would go out and beg the difference—his annual deficit, the making up of which became one of the chief burdens of his later years. His policy became popular, and a large proportion of sanatoria today are primarily for Trudeau's type of patient or make some provision for it. State and city institutions are usually entirely free, with admission naturally restricted to their own citizens. As it has worked out, there is now sanatorium accom-

modation for patients of every financial condition. In the Eastern States, however, the man and woman of ample means find few sanatoria available for them. Indeed, these are with few exceptions barred against them; for it has been urged that the well-to-do are able to travel where they wish and get what they want, and that the need uppermost is to take care of the hosts near home for whom tuberculosis means pecuniary as well as physical distress. It has been stated, also, that the wealthy would find sanatorium discipline irksome to the extent that they would not patronize well-conducted institutions that might be maintained by the fees received from them; or that, if they should elect to put themselves under institutional regimen, they would prefer this in surroundings which have the reputation of being in themselves of benefit to tuberculosis—in the high, dry and warm climates of the West and Southwest, where they are thoroughly able to resort.

Meeting the Personality Problem

A flaw in the sanatorium method that has suggested itself to the first advocates is the hazard to effective treatment of bringing together, in almost domiciliary association, for months, people of many types and of the greatest diversity of tastes and persons. It lays its hands upon the refined and the gross, the washed and the unwashed, the highly educated and the unlettered, the eager and the irresponsible, the gentle and the coarse, of every creed and race. Nor is any one of these traits always to be bought with money or lost with poverty. To meet the situation, sanatorium care should be at hand for all who suffer. The very essence of this treatment is a contented life in attractive surroundings; and how assure this in a welter of jarring personalities?

This real handicap is yielding slowly to time and experience. Trudeau's first idea to select his patients largely from one "stratum" was an attempt at a solution of the problem. His "cottage plan" of institution was another approach to it, for he aimed to house in small groups men or women of comparable interests. His experi-

ments and experience have since guided the policy of many later institutions. Meanwhile, there have developed sanatoria for members of a single race, or a single religious creed, or a single fraternal society, or even the employees of a single corporation. Many private and semi-charitable institutions have come to stand for an individualized and more or less sharply defined *clientèle*, shadowy though this may be; and the physician at home, in sending the patient away, now has considerable choice in fitting his patient to the company with which the latter is to learn "the cure." Those free institutions that are supported by taxation may not, of course, set up much in the way of standards of personality; and a patient in straightened circumstances whose tastes run to the exotic may here find much that is not to his liking. Yet here even, it is amazing to perceive how practice confutes theory. Fifty or a hundred people who, thrown together, find that they suffer much the same and face the same game of getting well, find also that they have more in common than had ever seemed possible, and the burrs and angles of personality grow softer in a new contact. There are "exquisites" whom tuberculosis has made still more noisome and unbearable; but there are just as many whom it has forced into "regular fellows" through association with an unfamiliar type. Mindful of the welfare of the child, we prize much about the signal benefits to be derived from the mixed association of the public school; tuberculosis may now and then work a not dissimilar reincarnation.

However, the requirements of the flesh come uppermost, and in every case for sanatorium treatment our first duty is to select that institution which, well equipped, will put upon the patient the least stress; and for most patients this will mean strain of purse and mind. The recent multiplication of sanatoria is making this choice easier all the time.

Schools for the T. B. Life

The sanatorium is today the center of tuberculosis treatment. Little by little it has become all-inclusive, until every standard institution can and

does offer every approved method of combating the disease. It pays attention to rest and exercise, to life in the open and to diet; it uses the more special remedies such as drugs, tuberculin, surgical procedures and the sun and light cure. As a rule, it can offer some climatic advantages. It keeps the most careful record of the patient's condition, as it watches from time to time in every case for the first signs of change from better to worse or from worse to better. It can therefore often forestall impending breakdown or fortify dawning improvement.

Now all this might be available for patients not in sanatoria, but at home under the care of their own physicians. It might be, theoretically, and in rare instances it is; but the conditions of medical practice make these instances so exceptional, indeed, that they are negligible in any survey of tuberculosis treatment as it actually exists. Whatever may be the sanatorium's merits in other respects, it is also true that the patient is far more certain of being furnished the same good treatment that he *might* get outside of it.

But, in addition to bringing together and correlating and proportioning properly all accepted methods of treatment, the sanatorium puts at the patient's disposal two agencies of tuberculosis management which nowhere else can be obtained so readily or practiced so effectively. These are the proper education of the patient in the part which he is to take and the well-ordered regulation of all the patient's activities to fit the individual case.

We have had a good deal to say about the place occupied by the patient's attitude and behavior in treatment. We have pointed out that fundamental to successful treatment is a complete yielding to circumstances, no matter how forbidding these may seem at the time, and a thorough willingness to sacrifice every indulgence of habit and appetite that may interfere with restraints imposed by treatment. No man can say that acquiescence and obedience, persisted in, will cure tuberculosis or even snatch the invalid from death. But they do offer the patient one of his few chances; without them any or all

treatment is made immeasurably more difficult and, without them, treatment in the end is of slight avail.

But there is, too, a more positive side to the attitude and behavior of the patient in tuberculosis treatment. For months, for years, perhaps for a lifetime, the man of active tuberculosis, if he is to survive and if he is to do something of the work of the world, must walk a path that is not that of what we call normal men in full health and vigor. Such a man must live and work and play according to certain rules. Summed up, these rules counsel that adjustment to circumstances, to environment, that will best assure the patient's living with the slightest possible manifestations of active tuberculosis. It is sad that there is no more royal road to relief from tuberculosis; but the fact remains. There are rules of living for the period of activity in its first flush, when the patient is consciously an invalid and begs for maxims on how to be made whole; there are rules for the time of release from symptoms, when, with brightening outlook and beckoning world, the sense of invalidism is liable to be submerged in a reawakened zest for the good things of existence; there are rules for years in the future, when symptoms have been long forgotten and the pressure of affairs bears harder and harder upon the one-time invalid.

The sanatorium is the best place yet devised where all details of adjustment to the necessities of tuberculosis can be taught the patient. In fact, many critics consider this educational part of sanatorium service its most important and effective function. Few patients spend enough time in sanatoria to have their disease thoroughly arrested. Most must continue "the cure" after they leave; and the sanatorium takes particular pains to teach all patients how to care for themselves, especially after they are thrown more on their own resources. It instructs them in the elements of general personal hygiene. It explains the interplay of conflicting forces of infection and human body, and points out every little practice through which the latter can best abate the former.

It is not enough for the sanatorium to drive home to the patient that sufficient rest and sleep are important parts of "the cure." It tells the patient where to place his bed and how to make it up, or what kind of chair is best for rest and where and how to arrange this to meet every condition of climate and weather. And into every activity, with a practical detail that meets all circumstances, it carries this kind of instruction. There can be little doubt that, with hardly an exception, every person with tuberculosis would be better off if, before entering upon whatever kind of treatment he chooses later, he could have a few weeks of sanatorium treatment, for the single reason of the unexampled education in personal management that the sanatorium affords.

The Curing Period

Less than six months is the residence of the average patient in the sanatorium in this country. There are private institutions that can keep a patient for years, for a period that is limited only by the patient's purse or inclination to remain. But the pressure of tuberculosis is so great, the new crops of patients come on in such numbers and with such regularity, that nearly all other sanatoria must put a time limit on care, and discharge their patients, no matter what their present condition or ultimate outlook, so as to give newcomers their chance to learn how to control their disease.

"To learn how to control their disease" is the utmost that sanatoria under present conditions can warrant their patients who ask what they may expect. They can guarantee this to every intelligent and amenable man and woman, and no one on earth can assure more after six months of any kind of care—not as long as the specific remains to the future. No sanatorium believes when, after six months or less of treatment, it sends its patients back into the world, that it has improved or arrested or cured these patients' disease to stay improved or arrested or cured. It hopes that it may have; but experience has taught it that it is foolish even to indulge in this hope. It has shown that the great

majority of these patients will again slip back into the clutches of the same old symptoms, and that in time most of them will, with varying velocity, go from bad to worse.

Now this is not the fault of the sanatorium or its treatment. If all sanatorium patients could get a year of treatment far fewer would fall into relapse; if two years, still fewer; and if longer, when necessary, very few. Hardly any one disputes this general statement. From whatever side one approaches the whole problem, one is forced to the conclusion that sanatorium treatment is a method of controlling tuberculosis with high effectiveness, but that it does not thus control it because it is insufficiently used for almost all individual cases. The necessities of the whole situation have put upon it a hit-or-miss policy of scattering its ammunition and of spreading out its influence as widely as possible, seeking to give all a chance while failing to get solid and permanent results, trusting blindly meanwhile that the help which it can extend for a short time will fortuitously save enough victims of tuberculosis to justify the effort.

But the results of its present efforts, hampered though the latter are by incompleteness of resources, suffice to point out unerringly what the future must bring forth, if what we know about the treatment of tuberculosis is to be turned to the greatest advantage. Since most patients get better in sanatoria and remain improved while they remain in sanatoria, and since this event does not follow any other known method of tuberculosis management, the conviction is inescapable that, again until the specific arrives, the only way that we can carry adequate hope to the hordes of consumptives is either to make possible indefinite lengthening of their stay in sanatoria or to devise workable plans that will carry sanatorium treatment or some modification of it into the homes of all discharged patients. Without trial, neither of these schemes may be dismissed as chimerical, tremendous as each would surely prove to be. On the face of things, the second plan would seem the more practicable.

The Home

At any time there are always more patients with tuberculosis undergoing some kind of treatment at home than anywhere else. Such patients comprise the thousands who have once had the benefit of sanatorium care and who, having learned the elements of treatment, have returned, not well enough to resume their usual life, or are suffering recurrent attacks of the disease. They also include many who, although they have never been in sanatoria, have had treatment away from home, in tuberculosis resorts, under careful supervision, or the haphazard advantages that may have accrued from unsupervised change of scene and climate. But the greater number of those who await the doubtful issue at home consists of those who have never been away for their disease, and whose sole treatment and management have been that afforded by occasional consultations with the family doctor, or resort to hospital dispensaries, where the latter have been available.

Until the day comes when every person ill with tuberculosis will be under sanatorium or climatic treatment during every period of illness, we must expect that the proportion of patients under treatment at home will be large. We must, therefore, be no less impressed by the importance of developing and perfecting home treatment to the utmost.

Important though it is, no treatment, speaking broadly, is so fraught with difficulties. The almost illimitable diversity of living conditions—physical, social, and economic—makes it impossible to contemplate any given plans as universally feasible. Although we leave out of consideration the matter of the availability of competent and adequate medical and nursing governance of all cases, it is obvious that detailed arrangements of environment to suit the tenement, the suburban home, the apartment, and the farmhouse would proceed along thoroughly different lines, and call for the greatest resourcefulness.

Yet brave and enthusiastic spirits have grappled with the problem at its hardest end. In conception and devotion to seeing it through, no finer work

in tuberculosis has been done anywhere than that of Joseph Pratt, in Boston. And he has done his work in the only practical way—by making the lives of the most unfortunate victims—the tuberculosis poor—his own. As physician, he has met these in his clinic and has found them with tuberculosis. As missionary, he has then labored for their welfare. He has gone into their homes and learned how they live. He has picked out the spot in the scant grass-plot or porch and shown where a chair or a bed might be placed, and how this can be best protected. He has painstakingly parcelled out with the patient the hours of work and leisure and rest. He has formed his patients into classes and met them “in school,” instructing them in tuberculosis and how to bend before it and how to stand up against it. He has acted father confessor, and advised and encouraged and strengthened.

A small work, surely—only a few hundreds out of millions approached thus! Yet Pratt has pointed the way. He has lengthened the days of many of his patients and kept them useful and productive. And the home treatment of the poor with tuberculosis can never be anything much different in principle from what Pratt has practised. His methods have served as a model for the relief work of tuberculosis societies and other organizations everywhere. Their efforts will approach effectiveness as these comprehend the personal touch and attention that have been so notable a feature in Pratt's work. It is not hard to imagine the tremendous salutary effect on tuberculosis that would follow if in every community only a few physicians, of proper temperament and training, could see their way clear to devote themselves, with zeal and whole-hearted enthusiasm, to this service. No one would intelligently disparage one jot the endeavors of the army of unselfish men and women who as medical missionaries are carrying relief to millions of sufferers of our more backward civilizations; yet one whose round takes him among the poor of our cities as these throng our hospitals and dispensaries may be allowed the opinion that our own towns and cities offer just as fertile opportunities

for similar unselfish service, and that in no domain is the need more pressing or the rewards more promising than in tuberculosis.

When the home is blessed with some conveniences, with light and air, and perhaps a patch of ground, with diverting prospects outside, and room for sheltered porch, some arrangements may, of course, be set up to resemble physically those offered by sanatoria. And a competent and attentive physician may luckily be at hand to complete in a measure the substitute for a sanatorium. Yet, even though every convenience and comfort of the sanatorium could thus be made available—and this would be the case in relatively few instances—and though medical direction would turn out to be all that could be desired, and the patient's life could be regulated in every little detail, it is questionable whether, in any but the fewest cases, the practice of "the cure" turns out to be as easy and as advantageous for the patient. Into the best-managed homes there enter daily occurrences that worry or irritate, or must receive attention from responsible members of the household. Few fathers or mothers can hope to escape these, so long as they are at home or within sight or hearing of what goes on there. They are, therefore, continually subject to many interruptions of that monotonous and peaceful routine of mind and body that is so essential to the successful performance of tuberculosis regimen. Away from home, they might worry about contingencies that might arise there, yet with nothing upsetting immediately to claim their attention, all their efforts are directed to the sole business of keeping to the daily schedule. Experience has abundantly taught that, by and large, the evil effects of almost necessary infractions of regimen caused by distractions at home far outweigh those of homesickness or worry about home affairs in patients who are away in well-managed sanatoria. For most patients the latter anxieties turn out to be much more distressing in theory than in practice.

Tuberculosis can, of course, be recovered from at home. The mass of

patients have no other resource than to make the attempt at home; and some, the few, come through with eminent success. Yet there can be no question that, if there is any choice, the sanatorium is preferable. Surely, every patient should, if possible, take a short sanatorium "course," if only for the training it will give him—a training that he can use to advantage in the best-appointed homes, with unlimited resources at his command, and family associates who are the perfection of intelligence, understanding and co-operation.

If the home and its environments are not readily convertible into the proper place for a patient to live and fight to get well, if the home is one with the ordinary turmoil and disturbance set up by healthy children, if family and friends are insistent in demands on the patient's time and effort, there can be simply no discussion about where the patient had better be. His own good, let alone his best chance, demands care in a sanatorium as long as he can command this. Such circumstances, too, fit the greater number of patients.

We have already hinted that all home treatment gains in effectiveness as it approaches sanatorium plan and method. This will include the transference to the home of every appliance and arrangement that sanatorium experience has found profitable in contributing to the ease and comfort of following treatment. It includes, no less, the same disposition of all hours of the day, the same portioning-out of rest and exercise, the same rigorous adherence to a well-ordered regimen, the same resourcefulness in meeting emergencies and unexpected occurrences that the sanatorium has evolved through years of observation in the treatment of countless cases. As between sanatorium and home treatment, such advantages or disadvantages as may obtain in change of scene and climate will also have their weight; but these will be discussed in their proper place. There is also the matter of the danger of infection from patient to home and neighborhood associates; but this will not enter properly into any discussion of treatment.

1. Tuberculosis
in the Home

WHERE DOES YOUR COUNTY STAND?

Death Rate From Tuberculosis in North Carolina for 1922 per
100,000 of Population Was 97.5

Death Rate for Whites 66.7

Death Rate for Negroes 169.6

DEATH RATE FROM TUBERCULOSIS BY COUNTIES

ALAMANCE -----	106.6	Johnston -----	47.1
ALEXANDER -----	113.1	Jones -----	39.1
Alleghany -----	67.5	Lee -----	71.8
Anson -----	99.7	Lenoir -----	86.2
Ashe -----	51.1	Lincoln -----	44.3
Avery -----	28.3	Macon -----	38.2
Beaufort -----	80.4	Madison -----	29.8
Bertie -----	90.7	MARTIN -----	101.8
Bladen -----	64.3	McDowell -----	62.5
Brunswick -----	26.6	Mecklenburg -----	81.9
*BUNCOMBE -----	489.1	Mitchell -----	62.0
Burke -----	96.7	Montgomery -----	34.2
Cabarrus -----	81.3	Moore -----	35.5
Caldwell -----	62.4	Nash -----	74.5
CAMDEN -----	148.6	New Hanover -----	98.0
Carteret -----	44.3	NORTHAMPTON -----	102.5
CASWELL -----	106.3	Onslow -----	47.1
Catawba -----	50.9	ORANGE -----	112.7
Chatham -----	45.6	PAMlico -----	132.4
Cherokee -----	51.5	PASQUOTANK -----	156.2
CHOWAN -----	131.4	Pender -----	67.6
Clay -----	41.3	PERQUIMANS -----	107.5
Cleveland -----	50.6	PERSON -----	123.7
Columbus -----	48.9	Pitt -----	79.2
CRAVEN -----	103.5	Polk -----	65.6
Cumberland -----	67.1	Randolph -----	51.2
Currituck -----	68.7	Richmond -----	62.7
Dare -----	0.	Robeson -----	69.5
Davidson -----	59.9	Rockingham -----	67.1
Davie -----	58.7	Rowan -----	74.3
Duplin -----	79.4	Rutherford -----	68.3
DURHAM -----	152.2	Sampson -----	85.2
EDGECOMBE -----	111.2	SCOTLAND -----	102.1
FORSYTH -----	111.7	Stanly -----	68.1
Franklin -----	77.2	Stokes -----	29.0
Gaston -----	43.7	Surry -----	51.2
Gates -----	56.8	Swain -----	28.6
Graham -----	61.1	Transylvania -----	20.3
Granville -----	65.9	Tyrell -----	41.2
GREENE -----	105.7	UNION -----	111.6
Guilford -----	78.4	Vance -----	97.1
Halifax -----	92.6	WAKE -----	100.9
Harnett -----	70.2	WARREN -----	100.3
Haywood -----	58.0	Washington -----	52.0
HENDERSON -----	101.2	Watauga -----	74.2
HERTFORD -----	151.3	WAYNE -----	135.7
*HOKE -----	187.6	Wilkes -----	57.1
Hyde -----	59.6	Wilson -----	82.0
Iredell -----	56.5	Yadkin -----	48.0
Jackson -----	74.0	Yancey -----	37.8

*Includes deaths in U. S. Government hospitals and out-of-State patients temporarily living in Asheville.

†Includes deaths at State Sanatorium.

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THE tuberculosis nurse is an officer in the peace-time army that is fighting tuberculosis in the home. Christmas Seals are her soldiers.

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Tuberculosis
with
Christmas
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NORTH CAROLINA TUBERCULOSIS ASSOCIATION
SANATORIUM, N. C.

